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Textbook of Rasa Shastra evam Bhaishajya Kalpana

(Ayurvediya Aushadhi Nirmana Vigyana) Vol. I

Dr. Vinay Kumar Kadibagil / Dr. Bargale Sushant Sukumar

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Text Book of
Rasa Shastra evam Bhaishajya Kalpana

(Ayurvediya Aushadhi Nirmana Vigyana)
(Vol. I)

(Subject Code- AYUG-RB)

Course Curriculum for Second Professional BAMS (Prescribed By NCISM)

By :

Dr. Vinay Kumar Kadibagil
M.D., Ph.D (Ayu), CYS (Yoga)
Professor
Department of Rasa Shastra & Bhaisjya Kalpana
SDM College of Ayurveda & Hospital, Hassan, Karnataka

Dr. Bargale Sushant Sukumar
M.D., Ayu., Ph.D., Ayu., M.Sc. Yoga
Department of Swasthavritta and Yoga
S.D.M. College of Ayurveda & Hospital, Hassan, Karnataka

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Mark distribution of theory examination

Paper I - Ayurvediya Aushadhi Nirmana Vigyana

Sr. No.	Chapter	Marks	MCQ (1 mark)	SAQ (5 marks)	LAQ (10 marks)
1.	Chronological development of Ayurvediya Aushadhi Nirmana	5	No	Yes	No
2.	Paribhasha (Terminology)	10	Yes	Yes	No
3.	Adharbhuta Siddhanta (Application of fundamental principles)	5	Yes	Yes	No
4.	Yantropakaranani- I (Equipment's and machine)	5	Yes	Yes	No
5.	Yantropakaranani -II (Equipment's fuel and Heating Devices)	5	Yes	Yes	No
6.	Kalpana Nirmana I (Primary & Secondary dosage forms)	10	Yes	Yes	Yes
7.	Kalpana Nirmana-II (Method of Preparation of different dosage forms& Dietary Supplements)	10	Yes	Yes	Yes
8.	Rasa Dravya Parichaya- I	10	Yes	Yes	Yes
9.	Rasa Dravya Parichaya II	5	Yes	Yes	No
10.	Rasa Dravya Parichaya III	5	Yes	No	No
11.	Kalpana Nirman -III (Method of Preparation of different dosage forms)	10	Yes	Yes	Yes
12.	Chaturvidha Rasayana	10	Yes	Yes	Yes
13.	Current and emerging trend in Ayurvedic Pharmaceuticals	5	No	Yes	No
14.	GMP (Schedule T) & Regulatory aspects of Ayurvedic drugs	5	Yes	Yes	No

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Vol. I

Ayurvediya Aushadhi Nirmana Vigyana

1 CHAPT. Chronological Development of Ayurvediya Aushadhi Nirmana

Syllabus

Definition, chronological development, significance and scope of Rasashastra and Bhaishajya Kalpana. Concept of Rasashala, Rasa-mandapa and Bheshajagara, Concept of Rasa-Rasayana Briefing on Indians are first to prepare metal-based medicines and Recent development in Ayurvedic Pharmaceuticals.

Learning objectives

1. Explain historical evolution of Ayurvediya Aushadhi Nirman and Rasashastra.
2. Describe about contribution of Nagarjuna Acharya to Rasashastra.
3. Enlist important classical texts of Rasashastra and describe their unique features in short.
4. Describe structure of Pharmacy and enlist formulations prepared in pharmacy, after visiting the unit of teaching pharmacy of own campus.
5. Describe Recent development in Ayurvedic Pharmaceuticals viz, new dosage forms, pharmaceutical modification techniques.
6. Define Rasa and Rasayana and describe difference between Rasa and Rasayana.
7. Justify design of ancient Rasashala.

Total - 3 hours (Lecture :02 hour, Non-lecture: 01 hours)

Marks- 5 marks, LAQ (10 Marks)- No, SAQ (5 Marks)- Yes, MCQ- No

Although Rasashastra was initially formed as an independent science, it later merged with Ayurveda. Although it is not regarded as one of the eight main branches (Ashtanga) of Ayurveda, it has grown in significance to the point where it is now an essential component of Ayurvedic medicine.

Definition of Rasashastra

The word 'Rasashastra' has two different constituents viz. Rasa and Shastra. The word Rasa has many meanings in Sanskrit language, however as far as this science is considered, it means Mercury. The word Shastra means detailed and scientific study. Thus, the literal meaning of the word Rasashastra is detailed and scientific study of Mercury. The science of metallurgy was very well developed in ancient India. Noble metals like Gold, Silver and other metals like Copper, Iron, Zinc, Tin, Brass, Bell Metal etc. were known and were practically used. Still ancient scientists chose Mercury for detailed study to form an important science called Rasashastra. For proper understanding of the concept behind this science, it is necessary to focus our attention to few well-known facts.

न च रसशास्त्रं धातुवादार्थमेव इति मन्तव्यम्।
देहवेधद्वारा मुक्तेरेव परमप्रयोजनत्वात्॥

(सर्वदर्शनसंग्रह)

When we consider the names of ancient Indian scientists and research workers of Rasashastra, it is revealed that they all were sages. For example, Patanjali, Vyadhi, Nagarjuna, Govindabhagwatpad and so on. These were the persons who did not indulged in many worldly routine activities and had

spent their lives in service of God. Therefore, it can be inferred that the science, Rasashastra was developed basically to prepare such medicine, which will increase longevity of life. Keep the healthy status of body constant so that a person can serve the God for longer and attain salvation.

While defining the Rasashastra it has been said that it is a science in which art of manufacturing drugs from mercury and other minerals and metals has been explained.

लोहंमृत कन्द विषं सूतं चेति निगद्यते । (र.र.स.28/2)

The word Loha includes metal like Svarna, Rajat, Tamra, Loha, Naga Vanga etc. the word Kanda means Vatsnabha like Visha Dravya whereas the word Suta is indicative of Parad along with Maharasa, Uparasa and Sadharana Rasa Dravya collectively. The science which deals with Parad, Maharasa, Uparasa, Sadharana Rasa, metals like Svarna. Rajat etc. Gems like diamond, pearl etc. and Visha Dravya like Vatsanabha is known as Rasa Shastra.

Chronological Development of Rasashastra

The chronological development of Rasa Shastra in explained under following headings-

1. Pre historic period (4000 B.C. to 1500 B.C.)
2. Vedic and Ayurvedic Samhita period (1200 B.C. to 8.00 A.D.)
3. Transitional period (8.00 A.D. to 1100 A.D.)
4. Tantric period (800 A.D. to 1300 A.D.)
5. Iatro chemical period (1300 A.D. to 1550 A.D.)

1. Prehistoric Period (4000 B.C. to 1500 B.C.)

This period can be divided into 2 Part-

a) Pre Harpappan period- 4000 to 2000 B.C.
b) Mohanjodaro and Harrappan period- 2500 to 1800 B.C. this period is also known as Indus valley civilization.

Pre Harappan period

- They know the art of making burnt or baked clay pottery.
- Painting of pottery with two or more colours.
- The art of extracting copper from copper ores.
- Working the metal into various articles by hammering, cutting and rolling.
- Beads made of lapis lazuli, carnelian and agate are the finding of this period also.

Mohanjodaro and Harrappan period /Indus valley civilization

- This period is also known as bronze period. Copper and bronze were most frequently used for domestic utensils, axe-heads, knives.
- Gold and silver were used as jewellery.
- They were familiar with four distinct types of copper and its alloys viz. (a) crude copper (b) refined copper (c) copper-tin alloy or known as bronze and, (d) Copper arsenic and copper arsenic lead alloys.
- Clay crucible were used to melt copper.
- Minerals like turquoise, rock crystal, lime stone, lapis lazuli agate etc. were used in the form of beads, pendants etc. for ornamental purposes.

2. Vedic and Ayurvedic Period

In the period of Rigveda use of gold, silver-copper and bronze was in practice among metals or metallic objects. The word 'Ayas' which occurs in many hymus of Rigveda. 'Ayas'' has been differentiated into Lohitayas and Krishnayas which represent copper and iron respectively. In the Yajurveda the following metals are mentioned.

अश्माच मे मृत्तिका च मे गिरयश्च मे पर्वताश्च मे सिकताश्च मे वनस्पतयश्च मे हिरण्यं च मे ऽयश्च मे श्यामं च मे लोहं च मे सीसं च मे त्रपु च मे यज्ञेन कल्पताम् । (यजुर्वेद 18/13)

Here Hiranya (Svarna), Ayas (Loha or Kamsya), Shyam (Tamra) Loha, Sisa (Lead) and Trapu (Vanga) are described in metal group whereas Sikta (Silica) Mritika etc. also described.

In Shatpatha Brahmana Svarna, Rajat, Tamra, Louha and Sisa are described which were used in different form. It can be concluding that origin of alchemical motions gathered round gold, lead etc. as early as the age of Atharvaveda.

Charak Samhita

In Charak Samhita various types are metals and minerals are mentioned as well as used in different formulations. Metals like Svarna, Rajat, Tamra etc., Ratna like Praval, Vaidurya etc. minerals like Hartala, Manahshila, Gairika etc. are used in different formulation. But the process related to Parada, Yantra, Musha etc. are not described in this text. The different Dravya are as follows-

सुवर्ण समलाः पञ्चलोहाः ससिकताः सुधा।
मनःशिलाले मणयो लवणं गैरिकाञ्जने॥
(च. सू 1/70)

Suvarna, Pancha Louha (Tamra, Rajat, Trapu, Sisa and Loha), Shilajatu (Mala), Sikta, Sudha, Manhshila, Aal (Hartala) Mani (Ratnas), Lavana and Anjana (Sauviranjana) are described under Parthiva Dravya.

In Charaka Samhita specific pharmaceutical procedure is described before using metal in the context of Lauhadi Rasayana.

त्रिफलाया रसे मूत्रे गवां क्षारे च लावणे।
क्रमेण चेङ्गुदीक्षारे किंशुकक्षार एव च॥
तीक्ष्णायसस्य पत्राणि वह्निवर्णानि वापयेत्।
चतुरङ्गुलदीर्घाणि तिलोत्सेधतनूनि च॥
ज्ञात्वा तान्यञ्जनाभानि सूक्ष्मचूर्णानि कारयेत्।
(च. चि.1/3/15-17)

The above process is summarised as follows-

The Tikshna Ayas made into Patra Rupa having dimensions of four Angula long and thickness to that of Tila → Heated into fire → Red Hot → Dipped into Triphala Kwatha, Cow's urine and alkali Drava (Jyotishmati Kshara, Ingudi Kshara and Kimsuka Kshara) → powder is made having the fine consistency to that of Anjana → then it is used internally. Mandoor, Makshika and Hema, Tamra, Praval, Mukta etc. described in Indrokta Rasayana are used in Churna form. Shilajatu, before using, it should be Bhavita with the Kwatha of Vataghana, Pittaghana or Kaphaghana drugs alone or with all for one week so that it could be potentiated.

वातपित्तकफघ्नैश्च निर्यूहैस्तत् सुभावितम्।
वीर्योत्कर्षं परं याति सर्वैरेकैकशोऽपि वा॥
प्रक्षिप्तोद्धृतमप्येनत् पुनस्तत् प्रक्षिपेद्रसे।
कोष्णे सप्ताहमेतेन विधिना तस्य भावना॥
(च. चि.1/3/50-51)

During the administration period of Shilajatu the Kulattha should not be ingested along with Vidhai, and Guru Ahara.

शिलाजतुप्रयोगेषु विदाहीनि गुरूणि च।
वर्जयेत् सर्वकालं तु कुलत्थान् परिवर्जयेत्॥
(च. चि.1/3/62)

Acharya Charaka has described different liquid to dissolve the Shilajatu before using it which is as follows-

पयांसि तक्राणि रसाः सयूषास्तोयं समूत्रा विविधाः कषायाः।
आलोडनार्थं गिरिजस्य शस्तास्ते ते प्रयोज्याः प्रसमीक्ष्य कार्यम्॥
(च. चि.1/3/64)

After proper consideration Dugdha, Takra, Mamsa Rasa, Yusha, Mutra and different Kwatha should be used as vehicle.

Sushruta Samhita

In this text various types of metals, minerals and gems are used as medicine for internal as well as external use. Different types of metals and minerals are grouped in Ushakadi Gana and Trapuvadi Gana in chapter thirty-eight of Sutra Sthana. viz.

ऊषकसैन्धवशिलाजतुकासीसद्वयहिङ्गूनि तुत्थकञ्चेति॥
(सु. सू. 38/37)

त्रपुसीसताम्ररजतकृष्णलोहसुवर्णानि लोहमलश्चेति॥
(सु. सू. 38/62)

In Ushakadi Gana, Ushaka, Saindhava Lavana, Shilajatu, Two types of Kasisa, Hingu and Tuttha are included whereas as Trapuvadi Gana includes Trapu, Sisa, Tamra, Rajat, Krishna Loha, Svarna and Loha Mala (Mandura) are included. Besides these Rasanjan and Srotoanjan are kept in Priyanguvadi Gana.

Ayaskriti was made before using metals in Sushruta Samhita. The detail is as follows-

तीक्ष्णलोहपत्राणि तनूनि लवणवर्गप्रदिग्धानि गोमयाग्नि-प्रतप्तानि त्रिफलाशालसारादिकषायेण निर्वापयेत् षोडशवारान्, ततः खदिराङ्गारतप्तान्युपशान्ततापानि सूक्ष्मचूर्णानि कारयेध्दन-

तान्तवपरिस्राविताानि, ततो यथाबलं मात्रां सर्पिर्मधुभ्यां संसृज्योपयुञ्जीत, जीर्णे यथाव्याध्यनम्लमलवणमाहारं कुर्वीत, एवं तुलामुपयुज्य कुष्ठमेहमेदःश्वयथुपाण्डुरोगोन्मादापस्मारानपहत्य वर्षशतं जीवति, तुलायां तुलायां वर्षशतमुत्कर्षः, एतेन सर्वलौहेष्वयस्कृतयो व्याख्याताः ॥ (सु. चि. 10/11)

This process can be summarised as follows-

Thin foil of Tikshna Loha → Smeared with Kalka of Lavana Varga → Heated on fire of Upla ↓ Red hot ↓ Quenched in Kwatha of Triphala and Shalsardi ← Process is Repeated for 16 times ← After this it is heated on fire of coal Agni of Khadira ← Self cooled ← Filter through cloth

Obtained churna is used internally

The above method is used for making Ayaskriti of all metals and is used in the dose accordingly to Bala of patient with honey and Ghrita. Beside this in Loharishta (Prameha Chikitsa) first Lauha Patra is strongly heated on the fire of Khadira coal then it is kept in heap of Yava Pallava for three or four months till Lauha is degraded after this it is used for the preparation of Loharishta.

श्लक्ष्णानि तीक्ष्णलोहस्य तत्र पत्राणि बुद्धिमान्।
खदिराङ्गारतप्तानि बहुशः सन्निपातयेत् ॥
सुपिधानं तु तं कृत्वा यवपल्ले निधापयेत्।
मासांस्त्रींश्चतुरो वाऽपि यावदालोहसंक्षयात् ॥
ततो जातरसं तं तु प्रातः प्रातर्यथाबलम्।
निषेवेत यथा योगमाहारं चास्य कल्पयेत् ॥
(सु. चि. 12/15-17)

The reference of using Parada as externally is as follows-

हेमाङ्गत्वक् पाण्डुपत्रं वटस्य कालीयं स्यात् पद्मकं पद्ममध्यम्।
रक्तं श्वेतं चन्दनं पारदं च काकोल्यादिः क्षीरपिष्टश्च वर्गः ॥
(सु. चि. 25/39)

एकादशैतान भागस्तु योजयेत् कुशलो भिषक्।
मूषाक्षिप्त तदाध्मातमावृत जातवेदसि ॥
(सु. उ.18/86)

Gandhaka is being used one of ingredients of Mahavajaraka Taila (Su.Chi. 9/60). Along with this the use of Musha is available as follows-

Astanga Sangraha and Hridaya

Like Charak and Sushruta in both these text Dhatus, Ratna and other minerals are used. In some places Parada, Rasottam and Rasa words are used with which Parada is accepted. The term Kaliyaka denotes Gandhaka. For Gandhaka the words like Gandhopala, Gandh and Gandha Pashana is also used. For example-

- गन्धोपलः सर्जरसो विडङ्ग-(अ.ह्र. चि. 19/67)
- त्रिंशद् भागा भुजंगस्य गन्धपाषाण पञ्चकम्- (अ.ह्र.उ. 13/51)
- कालीयकलताभ्रास्थिहेमकालारसोत्तमैः- (अ.ह्र.उ. 25/61)
- पत्रं पाण्डुवटस्य चन्दनयुगं कालीयकं पारदम्- (अ.ह्र.उ. 32/31)

It is cleared from above description that till 5th or 6th century A.D. the use of Parada and the specific process is not such as that are described in the texts of Rasashastra. Lauha and other minerals are used in Churna form. Ayaskriti is described but it is quite different to Bhasma process. In the classics of later period like Chakradatta Rasa Parpati is described and in Sharangadhara Samhita various process like Samskar, Shodhana, Marana which are typical Rasa Shastra process are available. It is indicative of that before this period i.e. 13th century A.D. and after 5th to 6th century A.D. Rasa Shastra has developed to its highest peak.

Transitional Period

From the beginning of this period one can find an increasing use of metallic preparations. Two main texts of this period are Siddha yoga and Chakradatta written by Vrinda and Chakrapani respectively. Parada has been mentioned as an ingredient of a medicine to be used externally for killing lice. Tamra Bhasma, Kasisa, Saindhav Lavana is used in preparing Anjana. Parpati Tamra and Rasamrita Churna are metallic preparation which were used by Vrinda.

Parpati, made from Kajjali, is contribution of Chakrapani that is prepared with the combination of Parada and Gandhaka. Tamra yoga, Pharmaceutical process to prepare Lauha Bhasma, use of Mandura and Raupya Mala (Calx of Silver) in Yogaraja is indicated in this text.

Tantric period

The development of Rasa Shastra of this period can be seen through the text written by Acharya Nagarjun's Rasa Ratnakar, Kachchha puta and other text like Rasarnava, Rasa Hridaya Tantra, Rasendra Chudamani, Rasa Prakash Sudhakar. Rasakalpa etc. At this stage Rasashastra has attains its peak stage.

Itaro chemical period

This period is specified by the texts like Rasa Ratna Samuchchaya, Rasa Ratnakar, Rasendra Chintamani, Rasasara, Shrangdhara Samhita, Rasendra Sar Samgraha. Rasa Kaumadi and Bhavaprakasha etc. From these texts we can get the development of Rasa Shastra. The texts of eighteenth and nineteenth century A.D. like Ayurveda Prakash, Rasa Tarangini and later text like Rasamritum, Parada Vigyanium, Ayurvedic pharmacopoeia of India. The Drugs and Cosmetic Act 1940 also have their role in development of Rasa Shastra.

Nagarjuna's Contribution to Rasashastra

There are many Nagarjunas in the History of Ayurveda. The tantric works like Kashaputa-yogasataka and Tattvaprakasha are ascribed to Nagarjuna. Nagarjuna was an Indian philosopher and Saint and the founder of the Madhyamaka school of Mahayana Buddhism. He was born in Amravati (presently the Guntur district of Andhra Pradesh) around 113 AD. Though Nagarjuna also travelled widely, he spent most of his life in a hilly area near Amravati. There he conducted extensive studies on the health applications of Mercury & other heavy metals for a significant part of his life. These studies, brought about, at that time, the visible re-emergence of this branch of Ayurveda, viz. Rasa Shastra, or Alchemy. Ayurveda itself, in later periods, began to incorporate Mercury as well as other "toxic" metals as important components of pharmaceutical formulations.

Books written by Nagarjuna

- Rasendramangala (Kakshaputa)
- Rasaratnakara

Definition of Bhaishajya Kalpana

Bhaishajya - It is defined as follows:

भिषक जिते हितत्वात च भैषज्यं परिचक्षते।
(Kash. Khil. 11)

भिषजा संस्तुतं द्रव्यं भैषज्यम्।
(Adhamalla on Shrangdhar. 1/1)

So, the Dravya that is recommended by physician or which is suitable for treatment is termed as Bhaishajya.

Kalpana

- कल्प (कृप + अच् + घ ञ् वा) -Practicable (Vamana Shi. Apte p 258)
- कल्पनम् (क्लृच् + ल्युट) - To give form, to make
- कल्पनं उपयोगार्थं प्रकल्पनं संस्करणमिति । (Chakrapani)

So, Kalpana is defined as the process by which any drug (Aushadhi Dravya) is converted into suitable form so that it can be used practically. So, the Bhaishajya Kalpana is defined that when a Dravya is converted into its suitable dosage form so that it can be used for treating the disease. It is known as Bhaishajya Kalpana.

In Bhaishajya Kalpana we studied various dosage forms. In the chapter namely Bhaishjyoupkramniya of Khilasthana, Kashyapa Samhita there is description of Aushadhi Adhishtana, Aushadhi Gyan, Bheshaja, Bhaishajya, Agada, Kashaya, Aushadhi, Guna, Bheda, Kala, Aushadhi Sevan Vidhi. Nishiddha Kala, Aushadhi Jirna Lakshana, Ajirna Lakshana dose according to age are also described, so it is concluded Bhaishajya Kalpana deals with preparation of various dosage form their method of administration, dose, amount of Prakshepa, Dravya to be added, Anupana and therapeutic use.

Chronological Development of Bhaishajya Kalpana

Chronologically it can be divided into following periods-

- Vedic period
- Samhita period
- Medieval period
- Modern period

1. Bhaishajya Kalpana during Vedic period

In Veda Aushadha and Ahara Dravya are found described abundantly. Rigveda has considered that Aushadhis are originated from Devata and are present in all three Yuga.

या औषधिः पूर्वा जाता देवेभ्यस्त्रि युगं पुरा।
मनै नु बभ्रूणामहं शतं धामानि सप्त च॥
(Rigaveda 10/97)

These are seven hundreds in number.

Reference of word Bhishaka and Bheshaja are also found in Rigveda

विप्रः स उच्यतें भिषक रक्षोहाऽमीवचातनः॥
(Rigaveda 10/97)

अभ्यूर्णोति यन्नग्नं भिषाक्ति विश्वं यत्तुरम्।
(Rigaveda 8/79/2)

युवं हस्थो भिषजा भेषजेभिः।
(Rigaveda 1/57/6)

So, it is cleared from above some mentioned references that Bhishaka and Bheshaja were part of Vedic period. The description of various Aushadhis like Karanja, Pippali, Arka, Ashvatha, Khadira, Amalaki, Tila, Durva, Apamarga, Arjuna, Goghuma, Masoora, and Soma etc. are present in Vedic literature.

In Atharva Veda the Aushadhis are divided into following four categories-

- Athrvani
- Anagirasi
- Daivi
- Manushyaja

For the mitigation of disease Prakritika, (Natural Dravya) Khanija (From earth), Samudraja (Obtained from sea), Pranija (Animal origin) and Uddbhija (Herbal origin) Dravyas were used. This can be depicted as follows:

Sl. No.	Category of Drug/Dravya	Example	References
1.	Prakritaka	Sun, Moon	Athra. 6/83/1
2.	Prakritaka	Agni	Athra. 10/4/2
3.	Prakritaka	Maruta	Rigveda 2/33/13
4.	Khanija	Anjana	Athra. 4/9/9
5.	Samudraja	Shankha	Athra. 4/10/4
6.	Animal	Mrigshringa	Athra. 3/7/1
7.	Udbhija	Herbs	

Prakritika, Pranija, Khanija and Samudraja Dravyas are described in very concise manner. However, herbals are available in detailed. The one adjective i.e. Apakreeta (Athrav. 8/7/11) is used to denote Aushadhis but these are sold and some are available through exchange. In Veda single drug therapy is available that includes Soma, Sahasraparni, Apamarga, Pippali, Ajashringi Prishanaparni etc.

In Veda the name of Kalpana is not given but Anjana Kalpana is present by its name. The Anjana is used as application into eyes, as Manidharana, Snana and Peya. Which is as follows-

आक्ष्वैकं मणिमेकं कृणुष्व स्नाह्येकेना पिबैकमेषाम्।
(Athra. 19/45/5)

But the method of preparation is not found. It is cleared that drugs were used in various form but their nomenclature was not given in Vedic period however their method of preparation is described. Here are some examples.

अरसं प्राच्यं विषम रसं यदुदीच्यम्।
अथेदमघराच्यं करम्भेण वि कल्पते॥
(Athra. 4/7/2)

Here Karambha is used for Vishajayna decolouration of Twak. It is grinded with water. So, it may conclude that it was used as Lepa.

यद् दण्डेन यदिण्वा यद् वाह्वर्हरसा कृतम्।
तस्य त्वमसि निष्कृतिः सेमं निष्कृधि पूरुषम्॥
(Athra. 5/5/4)

Laksha is used in wound due to injury. It should be ground and used as Lepa.

For the preparation of Soma Rasa its method and instruments used are described which is as follows. (Rigveda Mand 1/A6/Sutra 28)

यत्र ग्रावा पृथुबुघ्न ऊर्ध्वो भवति सोतवे उलूखल सुतानामवेद्धिन्द्र जल्गुलः ॥

Hey Indra, where Musala (Pestle) made of hard stone is used for grinding of Soma you take it repeatedly.

यत्र द्वाविव जघनाधिषवष्या कृता उलूखल सुनानामवेद्विन्द्र जल्गुलः ॥

Hey Intra where two Phalaka, Similar to Jangha (Thigh), are kept for grinding of Soma, take it (Soma Rasa).

ता नो अद्य वनस्पती ऋष्वावृण्वेभिः सोतृभिः । इन्द्राय मधुमत्सुतम् ॥

O Herbs (Like Ukhal-Musala) you press it filtration to prepare Soma Rasa used by Indra.

उच्छिष्टं चम्वोर्भरं सोमं पवित्र आ सृज । निधेहि गोरधि त्वचि ॥

After grinding Soma using Ukhala and Musala, some should be kept on holy Kusha and the rest part into Charma Patra. Here in the process Yantra/ Upakarana/Vessels and their used is summarised as follows.

Sr. No.	Yantra/Upaka-rana/Patra	Use
1.	Phalaka	Big stone for keeping Soma (As mortar)
2.	Amishravana	Keeping for grinding
3.	Grava	Used as pestle
4.	Aadhavaniya	Vessel used to keep Soma in form of Kalka
5.	Dasha pavitra	Used for filtering
6.	Chamasa	Used for collecting of Soma Rasa

Properties of Soma Rasa

आ । ईम । आशुभ । आशवे । श्रर । यज्ञऽश्रियम् । नृऽमादनम् । प त य त । मन्द यतऽसखम् ॥

Soma Rasa is Madaka and Sampat Rupa of Yagna. It is Prafullakarta, Karya Sadhan karta and Harsha Pradata and Mitra of Indra.

Shrita word is available in Shata Patha Bhramana. (2/3/1/14)

Anna and Ahara Kalpana during Vedic period

In Yujurveda various Annas are given

व्रीहयश्च मे, यवाश्च में माषाश्च मे तिलाश्च मे मुदगाश्च मे खल्वाश्च मे प्रियङ्गवश्च में मेऽणवश्च मे श्यामाकाच्च मे नीवाराश्च मे गोधूमाश्च मे मसूराश्च मे यज्ञेन कल्पन्ताम् । (Yajur. 19/21)

Dhana (Fried Anna), Karambha (Manda), Saktu, Parivapa (Fried rice), Paya (Milk), Dadhi (Curd), Aamiksha (Panner), Vaajina (Whey) and Madhu (Honey) were used during Yagna.

Comparison between Vedic and Samhita period Kalpana

Aushadhi Kalpana

Sr. No.	In Vedic	In Samhita
1.	Soma Rasa	Swarasa
2.	Silachi	Kalka
3.	Avaya Swarasa Paka	Kwatha
4.	Use of Visha with water	Hima/Phanta
5.	Peevasa Paka	Sneha Kalpana
6.	Arishita/Asava	Sandhana Kalpana
7.	Madya/Sura	Sandhana Kalpana

Ahara Kalpana

Sr. No.	In Vedic	In Samhita
1.	Dadhi	Dadhi Kalpana
2.	Takra	Takra Kalpana
3.	Ghrita	Ghrita
4.	Maitravaruni	Payasya
5.	Vajina	Mastu
6.	Amiksha	Kurchika

7.	Ghrita, Sarpi, Aajya	Ghrita
8.	Ghana	Bhurijta Anna
9.	Karambha	Anna Manda
10.	Tokma	Germinated Vrihi

So, it is cleared from above description that various Ahara and Aushadhi Kalpana were in use during Vedic period their nomenclature was not as similar to Samhita period.

- During Ramayana period the use of Sanjivani herb is found described.
- In Vinay Pitaka manufacturing, therapeutic use and dispensing of Aushadhi is described in detail. Ghrita, Madhu, Vasa, Kashaya, Fruit, Leaves, Gum, Lavana, Churna, Dhumrapana, Nasya, Madya etc. are described. (Vinay Pitaka Bhaishajya Skandha 6-Maharagga 6-215)

Kautilya Artha Shastra

During this period Aushadhi were collected and stored by Kushyadhyaksha, Dravyapala and Vanapala. It is manufactured in factory in the supervision of Panyadhyayaksha and kept it in stores. (2/16 and 2/5)

Aushadha Shala (Pharmacy) should be established in north west direction.

उत्तर पश्चिमे भागे पण्य भैषज्य गृहम्।
(Kau. Arth. 2/3)

There were some separate land as per government for production of Medicinal plant. (4/1)

धान्य स्नेह क्षार लवणगन्ध भैषज्य द्रव्याणां समवर्णोपधाने द्वादश पणो दण्डः। (Kau. Arth. 4/2)

For selling of spurious drug provision of Penalty of 12 Pana was in practice.

2. Bhaishajya Kalpana during Brihattryi

Charak Samhita- The principal of Bhaishajya Kalpana and dosages form are found in the whole Charak Samhita.

It is completed in eight Sthana. Sthana wise description related to Bhaishajya Kalpana is described as follows.

1. Sutra Sthana

- Use part of Jangama and Audbhidda Dravya-Chapter 1
- Drugs used in Panchakarma therapy-Chapter 2
- 28 types of Yavagu-Chapter 2
- 32 Types of Lepa-Chapter 3
- 5 Kashya yoni, 5 Kashaya Kalpana (Swarasa, Kalka, Kwatha, Hima, Plants) 50 Kashaya, 500 Mahakashaya-Chapter 4
- Definition of Pancha Kashaya Kalpana-Chapter 4
- Method of Dhoompana, Dhoomvarti Nirmana, Nasya, Anu Taila- Chapter 5
- Sneha Yoni (Sthavara and Jangama)-Chapter 13
- Hitakara and Ahitakara Ahara-Chapter 25
- 84 Asava and 9 Asava Yoni-Chapter 25
- Various Ahara Kalpana like Manda, Peya, Yavagu, Vilepi, Raga, Shadava etc.-Chapter 27
- Kashya, Sneha preparation and Siddhi Lakshana, Churna and Swarasa preparation.-Vimana Sthana
- Madhura etc. six Skandha-Vimana Sthana 8
- Bheshaja synonyms, types of Bheshaja, Various formulation, 10 Bheshaja Kala-Chikitsa Sthana 1
- Various formulation, collection and storage of drug, basic of Bhaishajya Kalpana, Man Paribhasha, Sneha siddhi Lakshana, Avaleha siddhi Lakshana-Kalpa Sthana 1
- Formulation and basic principle related to Pancha Karma-Siddhi Sthana

Sushruta Samhita- Although its field surgery but various important description of Bhaishajya Kalpana is available into it. Aacharya Sushruta has considered six basic Kalpana.

क्षीरं रसः कल्कमथो कषायः शृतश्च शीतश्च तथैव फाण्टम्।
कल्पाः षडेते खलु भेषजानां यथोत्तरं ते लघवः प्रदिष्टाः॥
(Su.Sut. 44/91)

That Ksheera (Latex), Rasa, Kalka, Kashaya,

Sheeta and Phanta are six Kalpana of Bheshaja. Other descriptions are as follows :

Kshara Kalpana	- Sutrasthana 11
Dose of Kwatha, Kalka, Churna	- Sutrasthana 40/14
Various Drava Varga	- Sutrasthana 45
Various Anna Varga (Including Manda, Peya, Vilepi etc.)	- Sutrasthana 46
Ayaskriti Kalpana	- Chikitasthan 10/11
Mana Paribhasha, Sneha paka and Siddhi	- Chikitsasthan 31

Ashtanga Sangraha and Ashtanga Hridaya

It is third and last text that comes under Brihat Trayi. It has very important place amongst Ayurvedic texts. It has described Ayurvedic cultural tradition of that time. In this Ashtanga Ayurveda is described in concise and cleared way.

सर्वतन्त्रायतः प्रायः संहृत्याष्टांग संग्रहः ।
अस्थानविस्तराक्षेप पुनरूक्तादिवर्जितः ॥
(As. S. Su. 1/18)

Ashtanga Sangraha generally includes all texts concepts in neither too long nor in short description avoid of Punrukti Dosha.

Both of the texts have counted five basic Kalpana as Swarasa, Kalka, Kwatha, Hima, and Phanta. Various types of classification of Aushadhi are given in Vividhaushadhi chapter. It has counted 45 Mahakashaya and 25 Ganas.

Anupana Vidhi is completed into 2 Chapters :

1. Drava Dravya Vigyaniya
2. Anna Svaroopa Vigyaniya

In Drava Dravya Vigyaniya Chapter there is description of Jala, Ksheera, Ikshu, Taila, Madya and Mutra Varga. Anna Svaroopa Vigyaniya chapter includes description of Shuka Dhanya, Shimbi Dhanya, Kritanna, Shaka, Mamsa, Phala and Matradi. In Ikshu Varga Sharkara derived from Kasha, Shara, Darbha, in Madya Varga use of Dhataki Pushpa and in Kritanna Varga Dakalavanika, Dharika, Indrika are contribution of this text.

धातकी गुड़तोयानि कारणं मद्यशुक्तयो ।
(As. San. Sutra. 7/243)

Use of Dhataki in Sandhana Kalpana (As fermenter) is contribution of Acharya Vagbhata.

The time period for digestion of Ahara and Aushadhi is 4 Yama and 2 Yama respectively.

Various Kalpana like Manda, Peya, Vilepi, Odana, Krishara, Yusha, Khala, Kambalika, Shushka Shaka, Virudhaka, Shandaki, Vataka, Parpata, Laja, Dhana, Saktu, Piyayatka, Shashkuli, Modaka, Apupa, Dharika, Indarika, Purnakosha, Utkarika, Payasa, Sanyava etc. are described in Anna varga.

In Aushadha Kalpana besides Pancha Kashaya Kalpana Aasava, Arishta, Sneha, Avaleha, Kshara, Lavana, Shatadhauta Ghrita, Sahsradhauta Ghrita. Basti, Nasya, Aashehyotan vidalaka, Dhoompana, Gandoosha etc. are described.

Kashyapa Samhita

Though its main content is related to paediatrics but some peculiar things related to Bhaishajya Kalpana is given in this Ayurvedic text. In this text Maulika Kalpana are counted as seven viz:

चूर्ण शीत कषायश्च स्वरसोऽभिषवस्तथा ।
फाण्टः कल्कस्तथा क्वाथो यथावतं निवोध मे ॥
(Kas. Khi. 3/34)

Churna, Sheeta, Kashaya, Swarasa, Abhishava, Phanta, Kalka and Kwatha these seven will be told by me as these are.

Difference between Aushadhi and Bheshaja is given as follows-

औषधं द्रव्य संयोगं ब्रुबते दीपनादिकम् ।
हुत व्रत तपोदानं शान्ति कर्म च भेषजम् ॥
(Kas. Ind. 6/5)

The combination of Dravya used in Deepana etc. is known as Aushadhi, the procedures like Huta, Vrata, Tapa. Daan and Shanti karma comes under Bheshaja.

- Dhoopa Kalpa, Shata Pushpa, Shatavari Kalpa, Lashuna Kalpa etc. are described in Kalpasthana.
- In Bhaishjyopkramaniya chapter Aushadhi

Jirna Lakshana, Ajirna Lakshana, Aushadhi matra etc. is given.

- Detail description regarding Yusha and Yavagu Kalpana is given in Yusha Nirdeshiya chapter.
- Dosage form used as Lehan is told in this text.

3. Madhyakala Bhaishajya Kalpana

Gada Nigraha, Chakra Datta, Sharangadhara Samhita etc. comes under this period. The development of Bhaishajya Kalpana of this time can be seen through these texts.

Gada Nigraha

It is written by Acharya Sodhala. Its chapter's name are according to Kalpana like Ghritadhikara, Tailadhikar etc. Various formulation and its therapeutic use are given in these chapters. This shows that the author has given more emphasis to Kalpana.

Chakradatta

It is written by Aacharya Chakrapani who is the commentator of Charaka Samhita also. Various concepts related to Bhaishajya Kalpana and Man Paribhasha is given in this text. The Kalpanas like Swarasa, Kalka, Kwatha, Hima, Phant, Aasava, Arishta, Ghrita etc. are described. In Aahar Kalpana Yusha, Yavagu, Raga, Shadeva, Takra. Manda, Peya, Vilepi etc. are considered. Kshara Sutra preparation is available in this book. The first-time use of Rasa Prapati in Grahani is given in this text. The Shodhanaa of Gandha Dravya is available in this book.

Sharangadhara Samhita

This Samhita has exclusively described the Bhaishajya Kalpana in a very well-arranged manner. Before this the Bhaishajya Kalpana available scattered manner. It is written by Aacharya Sharangadhara Mishra during 13th century A.D. It is completed into three Khand i.e.

1. Purva Khanda
2. Madhyama Khanda
3. Uttara Khanda

Purvakhanda

The following description is given-

- Manparibhasha-Magadha Maan, Kalinga Maan, Chaturguna Sutra.
- Drava, Aardra Dravya, Dwiguna Maan,
- Nava Purna Dravya Grahana rule
- Dry and fresh drug Grahana rule
- Anukta and Visheshakta Grahana
- Shelf life of Various Kalpana
- Anukuta Avayava Grahana rule
- Five Aushadha Kala
- Definition of various terms-Deepana, Pachana, Rasayana etc.

Madhyam Khanda

Various Kalpanas are described :

स्वरसः क्वाथफाण्टौ च हिमः कल्कश्च चूर्णकम् ।
तथैव गुटिकालेहौ स्नेहः सन्धानमेव च ॥
धातुशुद्धी रसाश्चैव खण्डोऽयं मध्यमः स्मृतः ।

(Sha. Purv. 1/9)

It includes twelve chapter in the name of Kalpana which are as follows:

1. Swarasa
2. Kwatha
3. Phanta
4. Hima
5. Kalka
6. Churna
7. Gutika
8. Leha (Avaleha)
9. Sneha
10. Sandhana
11. Dhatu Shuddhi Related to Rasa shastra
12. Rasa

In each chapter (Related to Kalpana) there is definition of that particular Kalpana, synonyms, method of preparation, Dose, Prakshepa, Dravya Matra, Anupana and Yoga with their therapeutic use is given.

Uttarkhanda

In this part the following Kalpana is described :

1. Basti
2. Nasya
3. Kavala
4. Gandusha
5. Nasya
6. Lepa
7. Anjana
8. Varti and Rasakriya

4. Modern period (Adhunika Kala)

Bhaishajya Ratnavali- This text is written by Sri Govind Nath Sen. There is description of Sneha Murcchana which shows development in the field of Bhaishajya Kalpana. Pratinidhi Dravya of various Aushadhi are given in this text some of these are follows-

कदाचिद् द्रव्यमेकं वा योगे यत्र न लभ्यते।
तत्तद्गुणयुतं द्रव्यं परिवर्त्तेन गृह्यते॥
(B.R. 1/51)

If in a formulation there is unviability of any one Dravya then the Dravya having similar properly to it can be taken in that particular formulation.

यत्र यद् द्रव्यमप्राप्तं भेषजे परपूर्वतः।
ग्राह्यं तद्गुणसाम्यात्तु न तत्र कापिदूषणम्॥
(B.R. 1/91)

In the condition of unavailability of any Bheshaja the drug having similar properly, may be Purvavarti or Parvarti, can be taken in place of that.

Significance and Scope of Rasa Shastra and Bhaishajya Kalpana

Acharya Bindu, in his text, has described three types of treatment :

या देवी प्रथमा सुंसस्कृतसैर्या निर्मितातद्रसैश्चूर्णस्नेहकषाय लेहरचिता स्यान्मानवी मध्यमा। शस्त्रच्छेदनलास्यलक्ष्मण-कृताचाराधमा साऽऽसुरीत्यायुर्वेद, रहस्यमेतदाखिलं तिस्त्राश्चिकित्सामताः॥ (Ras.Pad. 2)

There are three types of treatment the first one and superior to all is Rasa Chikitsa which is performed by Susamskrit Rasa. The second one is that which is done by use of Churna, Sneha, Kashaya, Leha and supposed as medium. The third one is Shastra Chikitsa and it is inferior.

अल्पमात्रोपयोगित्वात् अरुचेरप्रसङ्गतः।
क्षिप्रमारोग्यदायित्वात् औषधेभ्योऽधिकोरसः॥
(र.र.स. 28/1)

Rasa Aushadhis are superior due to-

- Dosage of the Rasa Aushadhis, is very little in quantity - (अल्पमात्रोपयोगिता)
- Rasa Aushadhis are easily acceptable and no taste (अरुचेः अप्रसङ्गः)
- Rasa Aushadhis bestow quick health (Arogya) (क्षिप्रमारोग्यदायिता)

अल्पमात्रोपयोगित्वात्- Generally, the dosage of the Rasayogas, is very small. They can be given as less as 125 mg. to 250 mg. It is evident that these are the combinations of various minerals and metals which are highly potent and many a times toxic. Small dosage is sufficient for pharmacological action. But as far as the dosage of the herbal medicaments is concerned, evidently it is very high. The contrast in the dosage is evident.

अरुचेरप्रसङ्गतः - Generally the Bhasmas and other Rasayogas rarely have any taste. They are almost tasteless. This facilitates the easy consumption of these medicines by patients, even in children. Compare this it the unpalatable taste of many herbal preparations e.g. Nimba Swarasa, Pancha Tiktaka Kwatha, Sudarana Ghana Vati, Triphala Churna etc. Hence tastelessness is an added advantage.

क्षिप्रमारोग्यदायित्वात्- Being highly potent they can absorb and assimilate in the body quickly, thus reversing the pathology and relieves the symptoms in less time. It is said that, many a times the action starts, as soon as these Rasa Yogas come in contact with salivary juice in the mouth. It is evident that, most of the drugs used in the Yogas have to undergo several processes like Shodhanaa and Marana, making them microfine, which accelerate the process of absorption and assimilation, bringing about quick relief.

There is a widespread notion that Rasa Shastra is useful only for transmutation purposes. It is clearly stated in 'Rasendra Sara Samgrah' as follows -

न च रसशास्त्रं केवलं धातुवादार्थमेव मन्तव्यं देहवेधद्वारा मुक्तिरेव परम प्रयोजनात्। यथा लोहं तथा देहे कर्तव्यः सूतकस्सदा। समानं कुरुते देवी प्रत्ययं देहलोहयोः। पूर्वं लोहे परीक्षेत ततो देहे प्रयोजयेत्॥

The scope of 'Rasa Shastra' is not limited to transmutation of metals. It is also to make human body as strong as iron through therapeutics, thereby removing impediments in the road to salvation. The Sutaka has to choose any metal in

medicinal preparation after thorough examination only.

The chief contribution of Rasa Shastra is stated in Rasendra Sara Sangraha as follows-

यथा न रोचते किंचिद्व्यञ्जनं लवणैर्विना।
रसशास्त्रं विना तद्वत्सर्वशास्त्रं न रोचते॥

As the curry is tasteless without the salt, no Shastra is appealing without the consideration of Rasa Shastra.

मृतानि लोहानि रसीभवन्ति निघ्नान्ति रोगान् परिशीलितानि।
किं चोपचारस्य समप्रयोगात् पुण्यन्ति धातूनतिदीर्घमायुः॥
(र.र.स. 28/104)

Bhasmas of different Louha being prepared by following actual procedures become Rasamaya (Parada). By using these are capable of destroying diseases. If these are used by following Pathya Ahara and Vihara then they nourish Rasa-Rakta etc. all the dhatu and provide longevity.

According to Rasendra Sara Samgrah the experts of medical field has said that treatment should be done in curable condition of disease while Rasaushadhis can be used in the condition of incurable disease. So, the Rasaushadhis are superior to all.

साध्येषु भेषजं सर्वमीरितं तत्त्ववेदिना।
असाध्येष्वपि दातव्यो सरोऽतः श्रेष्ठउच्यते॥
(र.स.स. 1/5)

The scholarly physicians can prescribe medicines only for curable diseases, but the Parada can be administered even in incurable diseases. Hence Rasa (and its preparations) are superior among all the medicaments. It is claimed that, these Rasa and Rasa Yogas are so potent that, they can even cure such diseases which are pronounced as incurable.

साग्रीनां चरकमतं फलमूलाद्यौषधं यदविरूद्धम्।
तद्यदि रसानुपीतं भवेत्तरा त्वरितमुल्लाघः॥
(र.चि. 8/3)

Peoples having good digestive power if they are administered herbal preparations after administration of Rasaushadhi then they become free from disease quickly.

Scope of Rasashastra and Bhaishajya Kalpana

- **Therapeutic Applications:** Both Rasa Shastra and Bhaishajya Kalpana contribute to the development of therapeutic agents used in Ayurvedic medicine. They are integral to the creation of formulations for treating various health conditions.
- **Traditional Knowledge Preservation:** These branches play a crucial role in preserving and passing on traditional knowledge related to the preparation and use of medicinal substances in Ayurveda.
- **Safety and Standardization:** With the emphasis on purification techniques and formulation principles, these branches contribute to ensuring the safety and standardization of Ayurvedic medicines.
- **Research and Innovation:** Ongoing research in Rasa Shastra and Bhaishajya Kalpana continues to explore new formulations, enhance existing ones, and integrate modern scientific methods for quality control and safety.

Concept of Rasashala

In the ancient period the place where procedures related to Parada were done was known as Rasashala. The description of Rasashala is given in the seventh chapter of Rasa Ratna Samuchchaya. The texts like Rasarnava, Rasatarangini also have described Rasashala. The description of Rasashala can be done under following headings.

1. Place or site of Rasashala
2. Working area (Karma Vibhajana)
3. Working staff in Rasashala
4. Instruments/Equipment's

1. Place of Rasashala

रसशाला प्रकुर्वीत सर्वबाधाविवर्जिते।
सर्वौषधिमये देशे रम्ये कूपसन्विते॥
यक्षव्यक्षसहस्त्राक्षदिग्विभागे सुशोभने।
नानोपकरणोपेतां प्राकारेण सुशोभिताम्॥
(R.R.S. 7/1-2)

Rasashala should be constructed as follows-

- Where there is no obstruction of any type and terror
- All types of herbs are available
- Where plenty of good quality water is present
- It should be faced at Yaksha (North), Triyaksha (Eshan) or Sahasraksha (East) direction.
- It should have its own boundary
- Various type of instruments that are used in Rasakarma should be available.
- It should be so constructed so that proper ventilation and Sunlight is there.

2. Working area in Rasashala

In the Rasashala different work is specified according to specific direction. It is known as Karma Vibhajana. The detail is as follows-

शालायाः पूर्वदिग्भागे स्थापयेद्रसभैरवम् ।
बह्नि कर्माणि चाग्नेये याम्ये पाषाणकर्म च ॥
नैर्ऋत्ये शस्त्रकर्माणि वारूणे क्षालनादिकम् ।
शोषणं वायुकोणे च वेधकर्मोत्तरे तथा ॥
स्थापनं सिद्धवस्तुनां प्रकुर्यादीशकोणके ।
पदार्थसङ्ग्रहः कार्यो रससाधनहेतुकः ॥
(R.R.S. 7/3-5)

This is given as below-

- In the East direction-Rasa Bhairava placement
- Aagneya direction-Agnikarma (Process that need heat)
- South direction- Pashana Karma (Grinding etc.)
- Nairitriya direction-Shastra karma (Cutting etc.)
- West direction-Kshalana (Washing)
- Vayavya direction-Shoshana karma (Drying)
- North direction-Vedha
- Ishan direction-Storage

Staff of Rasashala

Staff of Rasashala can be categorised as-

- Rasa Vaidya, Nighantugya etc.
- Paricharaka, Nidhisadhaka, Balisadhaka etc.

The detail is as follows-

The Vaidyas-

रससाङ्खिन्तका वैद्या निघण्टुज्ञाश्च वार्तिकाः ।
सर्वदेशजभाषाज्ञाः सङ्ख्यास्तेऽपि साधकैः ॥
(R.R.S. 7/24)

- In the Rasashala, Rasa Vaidya, Nighantugya (The person who knows everything related to herbs), the person who knows the language of all surrounding place (Desha) should be appointed for all time.
- The importance of Sarva Deshaja Bhashagya is that because he is the person who elaborate the knowledge of surroundings place.
- Different types of herbs are used in the process of Rasa Karma so Nighantugya can explain the extract herb.

Staff in the Rasashala

Paricharaka :

सोद्यमाः शुचयः बलिष्ठा परिचारकाः ।
(R.R.S. 7/26)

Paricharaka should have hard working, clean and have good stamina.

Nidhi Sadhak :

भूतनिग्रहमन्त्रज्ञास्ते योज्या निधिसाधने ।
(R.R.S. 7/30)

The person having knowledge of Bhoota Nighrah Mantra should appointed as Nidhi Sadhaka.

3. Bali Sadhaka

बलिष्ठाः सत्यवन्तश्च रक्ताक्षाः कृष्णविग्रहाः ।
भूतत्रासनविद्याःश्च ते योज्या बलिसाधने ॥
(R.R.S. 7/31)

The person having good stamina, truth speaking, red coloured eye black colour body complex and expend in Blood Trason Vidya should be appointed as Bali Sadhaka.

Person for Rasayan Karma :

निर्लोभा सत्यवक्तारो देव ब्राह्मण पूजकाः ।
यमिनः पथ्यभोक्ताशे योजनीया रसायने ॥
(R.R.S. 7/32)

The person who is not greedy, speaks truth, worship Deva and Brahman Jitendriya and follow Pathya Ahara and Vihar should be appointed for Rasayan Karma.

Person for Dhatuvata :

धनवन्तो वदान्याश्च सर्वोपस्करसंयुताः ।
गुरुवाक्यरता नित्यं धातुवादेषुते शुभाः ॥
(R.R.S. 7/33)

The person who is rich, speaks truth having characteristic of kindness to everyone, obeys the Guru's instruction is suitable for Dhatuvada.

Person for Bheshaja Sangraharana (Drug collection) :

तत्तदौषधनामज्ञाः शुचयो वञ्चनोज्झिताः ।
नानाविषयभाषाज्ञास्ते मता भेषजाहृतौ ॥
(R.R.S. 7/34)

The person who knows the name of every drug in different language, having good behaviour and thought, expert of different language during collection of herbs one have to move in different place so this type of person should know different language.

4. Instruments/Equipment's in Rasa Shala

In the Rasa Shala various instruments are required to do different work. The detail is as follows-

a) **Heating devices-**

सत्त्वपातन कोष्ठीञ्च सुराकोष्ठीं सुशोभनम् ।
भूमि कोष्ठीं चलत्कोष्ठी..... ॥
भस्त्रिकायुगलं तद्वन्नलिके वंशलोहयोः ।
(R.R.S. 7/6-7)

- Satvapatan Kosthi
- Sura Kosthi
- Bhumi Kosthi

b) Fuels- Coal, Cow dung cake.

c) Vessels- Made up of Svarna, Lauha, Kamsya, Tamra, Stone or dead skin

d) Instruments for grinding- Kandani, Peshni

e) Khalva- Semi Lunar, Rounded and Tapta Khalva made of iron

f) Vessel for storing water- Jalaroni

g) Sieves

h) Musha, Mritika, Tusha, Karpasha (Cotton), Kachakupi, Chashaka (bowl), Shurpa, Knife and other instruments should be collected and kept that are used for various work.

Rasa Mandapa

Before establishment of Rasa Mandapa, the Rasa Shala should be constructed. This Rasa Shala should be constructed with the following peculiarities.

आतङ्करहिते देशे धर्मराज्ये मनोरमे ।
उमामहेश्वरोपेते समृद्धे नगरे शुभे ॥
कर्तव्यं साधनं तत्र रसराजस्य धीमता ।
अत्यन्तोपवने रम्ये चतुर्द्वारोपशोभिते ॥
तत्रशाला प्रकर्तव्या सुविस्तीर्ण मनोरमा ।
सम्यग्वातायनोपेता दिव्यचित्रैर्विचित्रता ॥
(R.R.S. 6/11-13)

It should be situated in such place which is free from terror and the place is close to rich city where worship of God Shiva and Uma is performed. There should be a garden with four side entry. The Rasa Shala should be proper ventilated and depicted with Divya pictures.

तत्समीपे समेदीप्ते कर्तव्यं रस मण्डपम् ।
अतिगुप्तं सुविस्तीर्ण कपाटार्गलशोभितम् ॥
ध्वजच्छत्रवितानाढ्यं पुष्पमालाविलम्बितम् ।
भेरीकाहलघण्टादि शृङ्गीनाद विनादितम् ॥
(R.R.S. 6/14-15)

Closer to this the place which is plane and lightful, Rasa Mandap should be constructed. Rasa Mandap should be in secret place, extensive, has doors. It is decorated with flag, umbrella and garlands of flower. The round of drums (Small and big), bell, Shringi should come from here. The Vedi should be constructed near to this for Rasa Linga Sthapana and other things.

Rasa Linga construction and placing

निष्कत्रयं हेमपत्रं रसेन्द्रं नवनिष्ककम् ।
अम्लेन मर्दयेद्यामं तेन लिङ्गन्तु कारयेत् ॥
दोलायन्त्रे सारनाले जम्बीरस्थं दिनं पचेत् ।
तल्लिङ्गं पूजयेतत्र सुशुभैरूपचारकैः ॥
(R.R.S. 6/17-18)

Svarna foil 3 Nishka (12 gm) and Parada 9 Nishka (36 gm) both are mixed and grinded with the help of Amla Dravya for 1 Yama (3 hours) and it is shaped in Lingakara. After that it is boiled in Aarnal or Jambir Nimbu Swarasa by means of Dola Yantra for one day. After that Rasa Linga is worshipped by placing it into Rasa Mandapa. The worship is done by Aghora Mantra, Devi Mantra. The worship of various things which are useful in Rasa Siddhi should be done after making Vedi and placing it on this.

वज्र वैक्रान्त वज्राभ्रकान्त पाषाणटङ्कणम्।
भूनागः शक्तयश्चैताः षट्कोणे पूजयेत्क्रमात्॥
गन्धतालक कासीस शिलाकङ्कुष्ठभूषणम्।
राजावर्तो गैरिकञ्च ख्याता उपरसा अमी॥
पूज्या अष्टदलेष्वेते पूर्वादीशानुगङ्क्रमात्॥
रसकं विमला ताप्यं चपला तुत्थमञ्जनम्।
हिङ्गुलं सस्यकञ्चैव ख्याता ऐते महारसाः॥
पूर्वादीशान पर्यन्तं पत्राग्रेषु प्रपूजयेत्।
पूर्वद्वारे स्वर्ण रौप्ये दक्षिणे ताम्रसीसके॥
पश्चिमे वङ्गकान्तौ च उत्तरे मुण्डतीक्ष्णके।
सर्वमेतदघोरेण पूजयेदङ्कुशान्वितम्॥
(R.R.S. 6/47-52)

North (Munda & Tikshna Louha)

After placing Maharasa, Uparasa and Dhatus in the above-mentioned sequence the equipments, and various things like Vida, Kanji, Kshara, Pancha Mrittika, etc. are also placed at Vedi. Then these are worshipped by chanting Mula Mantra and the name of Rasa Siddhas are also remembered.

Bheshajagara

Acharya Sushruta has described the following storage materials.

लोतमृद्भाण्डफलकशंकुविन्यस्त भेषजम्।
प्रशस्तायां दिशि शुचौ भेषजागारमिष्यते॥
(Su.Su.36/17)

The drug should be kept in Lota (Cloth), Mridbhanda (Earthen pot), Phalaka (Wooden material) and then it should be hung with pin or rivet. The pharmacy should be constructed in right direction and place.

Storage according to Drugs and Cosmetics Rule- In schedule 'T' various store depending upon nature of raw material and finished product should be planned. The raw material should be kept in appropriate containers which would protect the quality of the raw material as well as prevent it from damage due to dampness, microbiological contamination or rodent and insect infestation etc. If certain raw materials require such controlled environmental conditions, the raw materials store may be sub-divided with proper enclosures to provide such conditions by suitable carbonization. While designing such containers, cabins or areas in the raw materials store, care may be taken to handle the following different categories of raw materials.

1. Raw material of metallic origin
2. Raw material of mineral origin
3. Raw material from animal source
4. Fresh Herbs
5. Dry herbs or plant parts
6. Excipients etc.
7. Volatile oils/Perfumes & Flavours
8. Plant concentrates/extracts/exudates/resins

Each of the container should by properly identified using label and state the status of raw material like under Test/Approved/Rejected/. All packaging materials such as bottles, jars, capsules etc. shall be stored properly and cleaned adequately and dried before packing the products.

The finished goods transferred from the production area after proper packaging and stored within an area marked ''Quarantine'' After examing for its quality it is kept in approved finished Goods stock area.

Concept of Rasa Rasayana

Rasa- In the Rasa Ratna Samuchchaya the following has been taken with the term Rasa.

रसस्य भेदाः- लोहं मृतं कन्द विषं सूतं चेति निगद्यते।
(R.R.S. 28/2)

The word Rasa is collectively indicative of Louha (Svarna, Rajat, Tamra etc.) Kanda viz Vatsnabha and Suta i.e. Parada itself.

रसे रसविषयक कर्माणि, रसायनेवापि यज्जराव्याधिनाशनं तस्मिन् ॥

The word Rasa is indicative of Parada related procedure where as Rasayan is that which is capable of to conquer the Jara Vyadhi. The Rasa acts as Rasayan when it is potentiated. Whereas Rasa is normally indicated in diseased condition. According to Ayurved Prakash-

ततो मारणा विधिना हत्वा मात्रयाऽशितः पथ्ययोगेन समे गन्धे तु रोगघ्न इत्यादि प्रोक्त फलकारी रसो भवति ॥

(A.P. 1/28)

After Gandhaka Jarana when Parada is Marita by following said procedure and it is consumed in Matra by following Pathya then Parada works as according to its Jarana Matra of Gandhaka viz Samguna, Dwiguna etc.

Whereas when it is used as Rasayana then :

अथ यदि रसायनगुणेच्छा चेद्वन्धजारणोत्तरं हेमाभ्रसत्त्वादि यथाविभवं गन्धक जारणोत्थिते रसे प्रोक्तविधिना संसाध्य जारयित्वा मारणविधिना हत्वा मात्राया क्षेत्रीकरणपूर्वकं पथ्य योगेन मण्डलावधि षण्मासं वर्षैकं द्विवर्षं त्रिवर्षं वा संसेव्यः । तदा तदुक्तफलमाप्नोति । (A.P. 1/129)

When Parada is used as Rasayana then after Gandhaka Jarana, Svarna Abhraka Satva etc. Jarana should be done and then Parada is Marita by following Marana procedure after that Kshtrikarana should be performed and then in proper dose it is consumed for one Mandal or six months or one year or two years or three years by following Pathya. By doing this the Parada provides Rasayana Guna.

कर्तव्य क्षेत्रीकरणं सर्वास्मिश्च रसायने ।
ना क्षेत्रीकरणाद्देवि किंचित्कुर्याद्रसायनम् ॥

(A.P. 1/484)

Kshetrikarana- It is the process by which the body is such accommodated so after ingestion of Samskarita Parada it should be assimilated to body. It is important before use of Rasayana.

स्निग्धं स्विन्नं विरक्तं च नीरूजं सिद्ध भेषजैः ।
एतत्क्षेत्रं समासेन रसबीजर्पण क्षमम् ॥

(A.P. 1/489)

Before using Rasayana the body should be Suddha by doing Snehana, Swedana and Virechana etc.

Briefing on Indians are First to Prepare Metal Based Medicines

Description of various text of Rasa Shastra

1. Rasendra Mangal- This text is written by Nagarjun as it is proved by the following verse of first chapter.

रसेन्द्रमङ्गलं श्रुत्वा यश्चिकित्सेच्चिकित्सकः ।
तस्य सिद्धिर्न सन्देहो स्वयं नागार्जुनोऽब्रवीत् ॥

(Ras. M. 1/2)

Period- In the history of Indian sub-continent the description of Nagarjun is found in various time period stage with the help of various evidence the time period of Nagarjun is supposed between 7th -8th century A.D.

Content- This text is completed in eight chapter but at present only four chapters are available.

रसोपरसलोहानां रसादौ साधनं ततः ।
वक्ष्यादौ मारणं वक्ष्ये द्रावणं सर्वधातुषु ॥
तृतीये रसबन्धं च चतुर्थे गुटिकाविधिः ।
वातादि सर्वरोगेषु चिकित्सा पंचधामता ॥
चित्र च गन्धयुक्तत्यादिरंजनं षण्ङ्के स्मृतम् ।
सप्तमं विषनेत्रं च त्वष्टमं गणसंख्यकम् ॥
अष्टाध्याय इति प्रोक्तं शास्त्रेऽस्मिन् रसमङ्गले ।
तत्रादौ मङ्गलं कृत्वा मङ्गलं मङ्गलायते ॥

(Ras.M. 1/3-6)

Ist chapter- Rasa, Uparasa, Loha Maran Vidhi, Parad Samskara

IInd chapter- Vajra, Vaikranta, Sarva Dhatu Satvapatana, Dravana Vidhi

IIIrd chapter- Jaran Charan Vida. Rasa Bandha. Different Rasa Yoga

IVth chapter- Gutika Vidhi, Parad Bandha and different Yoga.

Note- Kachchha Puta is also written by Nagarjuna. It is narrated in the form of question and answer between Ratna Gosha and Vata Yakshini which takes place in presence of

Nagarjun. In this text the dialogue between Nagarjun and Shalvahana is also present. All these dialogues have been completed in Shree Shaila Parvata near Hyderabad. One more Nagarjun is supposed Pratisamskarta of Sushruta Samhita.

2. Rasa Hridya Tantra- This text is composed by Pujya Pada Shrimat Govind Bhagvat Padacharya. He was Virakta and Yogiraj. This treaty is the heart of Rasa Vidya. According to description available in this text the writer first gains the Rasa Vidya from king Madan Rath who belongs to Haihaya Kula of Kirat Desha.

तस्मात्किरातनृपतेर्बहुमानमवाप्य रसकर्मनिरतः ।
रसहृदयाख्यं तन्त्रं विरचितवान् भिक्षुगोविन्दः ॥
(Ra.Hri.Tan. 19/80)

Period- There is difference of opinion in the time period of this text. It is supposed that this text is of 8th century A.D. but some scholars opine it of eleventh century.

Content- This text is completed in 19 Avabodha but according to Aacharya P.C. Roy it contains 21 Avabodha-Avabodha is the name of chapter. Different chapter contains following subjects-

Ist Avabodha - Parad Prashansa
IInd Avabodha - Ashta Samskar
IIIrd Avabodha - Gagan Gras
IV. Avabodha - Abhrak Satva Charana
V. Avabodha - Grabha Evam Bahya Druti
VI. Avabodha - Bijadi Praman Jaranayukti
VII. Avabodha - Vida Vidhan
VIII. Avabodha - Rasarag
IX. Avabodha - Bija Vidhan
X. Avabodha - Satvanirgamavidha
XI. Avabodha - Bija Nirvahan
XII. Avabodha - Dwandwa melan
XIII. Avabodha - Sankar Bija Adhikar
XIV. Avabodha - Sankar Bija Jarana
XV. Avabodha - Druti Prakarana
XVI. Avabodha - Sarana
XVII. Avabodha- Kramana
XVIII. Avabodha - Bedha Vidhan
XIX. Avabodha - Bhakshana Vidhan

Rasarnava- It is one of famous and old classics of Rasa Shastra. The time and writer of this Grantha is not cleared. But description of content indicate that this book belongs to writer of Shaiva Sampradaya. This text is completed in the dialogue between Parvati and Bhairava. Most of the scholars opines that it is written by Bhairavanand Yogi.

Period- There is difference of opinion in the time period of this text Sir P.C. Roy opines it between 6th to 11th century.

Kedarnath is mentioned in one verse which indicate this was written after the establishment of it. Initially it was worshipped by Pandavas but later it was reformed in eight century A.D.

केदारादीनि लिङ्गानि पृथिव्यां यानि कानि च ।
तानि दृष्ट्वा तु यत्पण्यं तत्पुण्यं रसदर्शनात् ॥
(Rasa. 1/38)

Content- The chapter of this text is termed as Patal. It contains total eighteen Patals which is as follows-

- I Patal- Jeevan Mukti, Parad Mahatmaya description
- II Patal- Guru, Shihsya etc. description
- III Patal- Rasa Karma, Mantra Nyasak question
- IV Patal- Yantra, Musha, Koshthi
- V Patal- Herbs description used in various Rasa Karma
- VI Patal- Maharasa, Uparasa
- VII Patal- Maharasa, Uparasa
- VIII Patal- Raga Samkhya Evam Vija Nirupana
- IX Patal- Vida Nirmana
- X Patal- Rasa Vishyak questions
- XI Patal- Parada Charana, Jaran Bandha etc. description
- XII Patal- Murchchana, Divyaushadhi description
- XIII Patal- Baddha Jarna
- XV Patal- Beeja Ranjana and Bandha

- XVI Patal- Baddha Parada Dravana
- XVII Patal- Sarana, Kramana

Goraksha Samhita

This Samhita is written by Guru Goraksha Nath who belongs to Nath Sampradaya. There is difference in opinion in fixation of Kala of this Samhita. Some scholars fix it around tweleveth century A.D.

Content- It is completed in 2 parts

1. Kadi Prakarana
2. Bhuti Prakarana

The chapter of this Samhita are termed as 'Patal'. Kadi Prakarana is completed in 27 Patalas that includes Mantra, Tantra. It is elaborated in the dialogue between Devi and Bhairava. Bhuti Prakarana is available in nine Patals which is in the form of Shakti and Shri Kantha dialogue. In this content Rasa, Rasayan, Parada Samskar and various process are described.

- I Patal- Rasa Kalpa Phala
- II Patal- Dravya collection
- III Patal- Dhatu Shodhanaa
- IV Patal- Jivotsarg Vidhana
- V Patal- Bija Sambandha
- VI Patal- Rasoparasa Karma
- VII Patal- Divya Aushadhi Lakshana, Karma
- VIII Patal- Ayaskanti etc. description
- IX Patal- Rasayan Vidhi, Rasajirna Lakshana. Rasa Siddhi type.

Rasendra Chudamani

This famous Rasa text is written by Acharya Somdeva. Rasa Ratna Samuchchaya has followed it many times. From the description of second chapter, it is cleared that Rasacharya Somdeva was king of Bhairavapur in the dynasty of Mahaveer.

नन्दीनागार्जुनश्चैव ब्रह्मज्योतिर्मुनीश्वरः ।
वेत्ति श्री सोमदेवश्च नाऽपरः पृथ्वीतले ॥
(Rasa Chu.15/54)

Content- This text is completed in sixteen chapters. In these chapters Rasa Shala, Yantra, Musha, Puta, Paribhasha Prakarana, Eighteen Samskar of Parada, Maharasa, Uparasa, Ratna, Dhatu and their properties etc. are described. Aacharya Somdeva has also followed various Acharys that includes Nandi, Govinda Acharya, Bhaskar, Bhaluki etc.

Rasa Prakash Sudhakara

This text in written by Shri Yashodhar Bhatt who is son of Shri Padmanabha and belongs to Saurashtra (Region of Jamnagar, Junagarh, Rajkot of modern Gujarat). Rasa Ratna Samuchchaya has also follow to him. The period this classic is 13th century A.D.

Content- This book is completed in thirteen chapters. In which eighteen Samskaras of Parada. Rasa Bhasma, Rasa Bandha, Dhatu, Maharasa, Uparasa, Ratna, Yantra, Musha, Puta etc. have been described. Akarkara, Ahiphena has also been used in it.

Rasa Ratna Samuchchaya

This text has been written by Vagbhata who is son of Simha Gupta. The author has followed several texts before compilation.

रसेन्द्रतिलको योगी भालुकी मैथिलाह्वयः ।
महादेवो नरेन्द्रश्च वासुदेवो हरीश्वरः ॥
एतेषां क्रियतेऽन्येषां तन्त्राण्यालोक्य संग्रहः ।
रसानामथ सिद्धानां चिकित्सार्थोपयोगिनाम् ॥
सूनुना सिंहगुप्तस्य रसरत्नसमुच्चयः ॥
(R.R.S. 1/7-8)

The period of this text is thirteenth century A.D.

Content- This book is completed in two part and thirty chapters which is as follows-

- Pratham Khanda- 1 to 11 chapters
- Uttar Khanda- 12 to 30 chapters
- The description of Pratham khand is as follows-
- Ist chapter- Himalaya description, Rasotpatti and definition of various types of Rasa
- IInd chapter- Maharasa
- IIIrd chapter- Uparasa, Sadharana Rasa
- IVth chapter- Ratna
- Vth chapter- Dhatu

- VIth chapter- Rasa Shala, Shishyophayana, Rasa Mandapa etc.
- VIIth chapter- Rasa Shala
- VIII chapter- Paribhasha
- IX chapter- Musha, Puta, Aushadhi Varga
- XI chapter- Man Paribhasha, Parada Samskar and Bandha.
- In the chapters of Uttar khanda i.e. 12-30 treatment of various disease, Rasayan, Vajikarana, Visha Kalpa, Louha Kalpa and Rasa Kalpa is described.

Rasa Ratnakar

The author of this text is Nitya Nath who belongs to thirteenth century A.D. while some other opines him to that of fifteen century A.D.

This text is completed in 5 Khand which is as follows-

1. Rasa Khanda-Chiefly related to Vaidya
2. Rasendra Khanda-Mainly deals with Vyadhi
3. Vadi Khanda-Related to Dehavada
4. Rasayana Khanda-Related to Rasayana
5. Mantra Khanda-Related with Mantra and Rasa Siddha

पंचखण्डमिदं शास्त्रं साधकानां हितं प्रियम्।
रसखण्डे तु वैद्यानां व्याधितानां रसेन्द्रके॥
वादिनां वाद खण्डे च वृद्धानां च रसायने।
मन्त्रिणां मत्रखण्डे च रससिद्धि प्रजायते॥

The chapter of this text is known as Upadesha.

Anand Khanda

Manthan Bhairav is accepted the author of this text. This Rasa Grantha is published by conjunction of manuscript available in library of Tanjaur, Mysuru's old museum and publication in Akhil Bhartiya Ayurveda Maha Mandal Patrika. Ananda Kanda is one such important text written in 13th century.

Content- The book is completed in two part. The name of chapter is Ullas.

1. Amrutikaran Vishranti - 26 Ullas
2. Kriyakarana Vishranti- 10 Ullas

- This text is narrated in the form of dialogue between Bhairav and Bhairavi. In the twelveth Ullas of Amrutikarana Vishranti special description of Shri Shaila Parvat is given so it is concluded that it is written around here and this place is called as the place of various Siddhis. In Amrutikarana Vishranti Rasotpatti, Parada Samskar, Rasayan, Ratna, Gandhaka, Yoga Rasayan, Sadachar, Ruitucharya and in Kriyakaran Vishranti Uparasa, Svarna, Tamra, Naga, Vanga and sixty-four Divyaushadhi along with eighty-four Mahoausahdhi are described.

Rasa Paddhati

This book is written by Aacharya Bindu resident from Maharashtra in 13th century A.D. This book is completed in one Chand of a ''Shardul vikridita''. This contains a total of two hundred thirty-one verses in which Parada Samskar, Maharasa, Uparasa, Ratna etc. are described.

Sharangadhara Samhita

The author of this Samhita is Sharangadhara Mishra. It is included in Laghuttari and is the main text related to Bhaishajya Kalpana. In the eleventh and twelfth chapter of Madhyam khanda of this Samhita there is description of Rasa Dravya and various process and Rasa yoga. The eleventh chapter's name is Dhatu Shuddhi which deals with Dhatu, Upa dhatu, Shilajatu, Mandura and its Shodhana, Maran etc. The seven Upadhatu includes Makshika, Tuttua, Abhraka, Nilanjana, Manhshila, Hartal and Rasaka. In the twelfth chapter three is description of Parada, nine types of Dhatus, Rasa Shodhanaa, Gandhaka, Parada Shodhanaa, extraction of Parada from Darada (Hingula). Mukha-Karana, Gandhaka Jarana, Parada Marana and various Rasa Yogas.

Rasa Chintamani

This text is written by Anant Dev Suri in fifteenth century A.D. The author has not mentioned his birth place, time, name of father etc. anywhere in text. In the last he has mentioned himself as Vaidya.

Content- It is completed in eleven chapters the name of the chapter is as Stabaka. The detail is as follows-

- 1st Stabaka - Rasa Bhasma, Rasa Gutika, Rasa Gras Vidhi
- 2nd Stabaka- Different Rasa Yoga
- 3rd Stabaka- Different Kushtha Nasak Yoga
- 4th Stabaka- Various Rasa Yoga
- 5th Stabaka- Parada Samskar, Hartala Louha etc. Satva and Bhasma Vidhi
- 6th Stabaka- Svarna and Rajat description
- 7th to 11th Stabaka- Different Rasa Yoga

13. Rasendra Chintamani

लघीयः परिणामतया निखिलरसज्ञानदायित्वाच्चिन्तामणि-रिवचिन्तामणिः ॥ (Rasen. Chinta-1/3)

Chintamani, being of small in size it gives pleasure to all worried person like wise this text having small size it give all knowledge about Rasa Vidya. The author of this book is Dhundhuk Nath. The time period of this text is beginning of fifteenth century A.D.

Content- This book is completed in nine chapters. Which is as follows :

- 1st Chapter- Rasa description
- 2nd Chapter- Murchchana and Jarana
- 3rd Chapter- Parada Samskar
- 4th chapter- Abhraka Shodhana, Marana, Satva, Druti
- 5th chapter- Gandhaka Shodhana, Taila
- 6th chapter- Dhatu description
- 7th chapter- Visha and Ratna
- 8th & 9th chapter- Different Rasa Yoga

Rasa Manjari

The author of this classic is Aacharya Shali Nath. He was son of Vaidya Nath. The text is completed by following previous texts. The time period is 15 centuries.

श्री वैद्यनाथ तनयः सुनयः सुशीलः श्री शालिनाथ इति विश्रुत नामध्येम् । तेनावलोक्य विधिवद् विविध प्रबन्धानारम्यते सुकृतिनां रसमञ्जरीयम् ॥

Content- This book is completed in ten chapters. In which Parada, Shodhana, Marana, Jaran, Murchchhana, Uparasa, Visha types and Lakshana, Dhatu Shodhana and Marana, Rasa yoga, Rasayana, Sukrastmbhaka Yogà and Arista Vigyana is elaborated.

Rasendra Sar Sangraha

The author of this text is Shri Gopal Krishna Bhatt who belongs to sixteenth century A.D.

Content- It is completed in five chapters-

- Ist chapter- Parada and its eight Samskaras, Rasa Bhasma, Uparasa, Dhatu and various Dravya Shodhana.
- IInd chapter- Treatment of different disease
- IIIrd chapter-Balroga treatment
- IVth chapter-Visharoga Pratishedha
- Vth chapter- Rasayana and Vajikarana

Rasa Kaumudi

This text is written by Shri Gyan Chandra Sharma who belongs to sixteen century A.D.

Content- It is completed in four Adhikar in first and second Adhikar Parada description. Third Adhikar Gandhaka etc. and in fourth Adhikar various Yogas are given.

- Basava Rajiyum
- This text is written by Vasavraj who is follower of Lingayata Mata from Karnataka. The time period is around 15-16th century A.D.

कृते तु चरकः प्रोक्तस्त्रेतायां तु रसार्णवः ।
द्वापरे सिद्धविद्याभ्: कलौ बसवसकः स्मृतः ॥
(1/15)

In Krita Yuga Aacharya Charak, in Tretayuga Rasarnava, in Dwapara Yuga Vaidyaka and in Kaliyuga Basaurajaiyam is appreciation. It is completed in twenty-five chapters. In twenty fifth chapter description of Rasa Dravya is narrated.

Rasa Kamdhenu

The author of this book is Shri Chudamani Mishra who belongs to sixteenth century. The book is completed in four Pada namely.

1. Upakarana Pada- Yantra, Musha, Puta
2. Dhatu Samgraha Pada- Parada Shodhanaa
3. Rasa Karma Pada- Parada Samskaras, Jarana, Lauha and Dhatu Vada.
4. Chikitsa Pada different disease and Rasa Yoga.

19. Ayurveda Prakash

This book is written by Aacharya Madhav Upadhyay who belongs to Saurashtra in sixteen century A.D. According to author he has described only such work which he has learned by teachers-

अश्रौषं बहुविदुषां मुखदपश्यं शास्त्रेषु स्थितं न तल्लिखामि ।
यत्कर्म व्यरचयमग्रतो गुरूणां प्रौढानां तदिह वदामि बीतशङ्कः॥

Content- It is completed in six chapters as follows-

- Ist chapter- Parada Samskar, Jarna, Murcchana etc.
- IInd chapter- Uparasa
- IIIrd chapter- Dhatu
- IVth chapter- Svarnamakshika, Vimal, Tuttha etc.
- Vth chapter- Ratna
- VIth chapter- Visha description

20. Vrihad Rasa Raj Sundara

The author of this book in Shri Datta Ram Chaubey in nineteenth century. This book includes description of Parada, Gandhaka, Dhatu, Upadhatu along with Uparasa, Ratna, Visha, Yantra, Musha. The use of specific Dravya in the condition of ingestion of Ashodhita and Asamyaka Marita Dravya is given in this book.

21. Rasa Tarangini

The author of this book is Aacharya Sadanand Sharma who belongs to twenty century A.D. viz.

घिल्डियालोपसंज्ञेन सदानन्देन शर्मणा ।
निबध्यते महायत्नादियं रसतरङ्गिणी ॥
(R.T. 1/8)

Content- This book is completed in 24 Tarang. The name of chapter is as Tarang :

1. Tarang- Rasa Aacharya name, Guru, Shishya. Rasa Shala etc.
2. Tarang- Paribhasha Prakarana
3. Tarang- Musha and Puta
4. Tarang- Yantra description
5. Tarang- Parada Shodhana, Ashta Samskaras, Kshatrikarana
6. Tarang- Murchchana, Rasa Pushpa, Kajjali, Rasa Parpati etc.
7. Tarang- Parada Marana etc.
8. Tarang- Gandhaka description
9. Tarang- Hingula
10. Tarang- Abhraka
11. Tarang- Hartala, Manhshila, Shankha Visha, Fitkari, Godanti etc.
12. Tarang- Shankha, Shukti, Varatika, Shringa, Samudraphena etc.
13. Tarang- Yavakshar, Sajjikshar, Tamkana
14. Tarang- Navasadar, Soraka, Lavana etc.
15. Tarang- Svarna Dhatu
16. Tarang- Rajat Dhatu
17. Tarang- Tamra and Bhoo Naga
18. Tarang- Vanga, Svarna Vanga
19. Tarang- Sisa, Yashada
20. Tarang- Louha and its variety
21. Tarang- Svarna and Rajat Makshika, Tuttha Sindoor, Kharpar etc.
22. Tarang- Pittal, Kamsya, Shilajatu, Gairika etc.
23. Tarang- Ratna and Uparatna
24. Tarang- Visha and Upavisha

In this text various type of liquid described in modern chemistry is narrated with its Samskrita name like Gandhaka Drava-H_2SO_4, Sorak Drava HNO_3, Lavana Drava HCl, Parishruta Jala (Distilled water) etc.

Rasapaddhati

Bindu has written this work during 13th AD and some historians opine that he belongs to 15th AD. The total text was written in one candas of Sardula-vikridita. Yadavji has edited and published it during 1925 from Nirnayasagar Press, Bombay.

Rasasara

This work is of Govindacarya; the author says

that the system of alchemy was known to the Buddhists of Bhota region and that he was composing the work because of his knowledge of Buddhist literature. From this, it is clear that alchemy was popular among the Buddhists of Tibet in the twelfth and thirteenth centuries. This work describes the use of opium, but does not mention its source and says that it originates from some poisonous sea-fish.

Govindacarya has written this work during 14th AD. He belongs to Kapalika Parampara. Parada Atadasa Samskara were discussed in detail.

Dhaturatna Mala

Devadatta composed Dhaturatna mala during 14th AD.

Sarva Darshana Samgraha

The philosophical background of Jivan Mukti (salvation while the individual is alive) was explained by Madhavacharya during 14th century in his Sarva Darshana Samgraha. A separate section of this work called Rasesvara Darshana deals with this topic.

Recent Development in Ayurvedic Pharmaceuticals

Ayurvedic Pharmacopoeia of India (A.P.I)

Ayurvedic Pharmacopoeia of India is legal document in which quality standards of Ayurvedic drugs and substances are described to fullfil the provisions related to Ayurvedic drugs given in the Drugs and Cosmetics Act 1940. It is published in two parts. In Part I monograph on single drugs in different volume while part II includes monograph of drug formulation. Monograph of Single drug included in Part I there is description of plant origin drug including its part used along with pharamacognostical, chemical and Ayurvedic standard. Macroscopic, microscopic characters along with chemical standard of identity, foreign matter's permissible limit, purity and strength are developed which is approved by Ayurvedic Pharmacopoeia Committee. The other parameters like Total Ash value, Acid insoluble Ash, Alcohol soluble extractive. Thin layer Chromatography TLC etc. are also described.

The following volumes of Part I are published

Volume	Description
I	60 single drug monograph
II	78 single drug monograph
III	100 single drug monograph
IV	68 single drug monograph
V	92 single drug monograph
VI	101 single drug monograph
VII	Monograph on 21 metal & mineral drugs.
VIII	60 monograph in which description of Drug, Drug powder, Hydro alcoholic extract and water extract is available. For example Amalaki, Amalaki Churna, Amalaki hydro alcoholic extract and Amalaki water extract.
IX	15 monograph in which single, Hydro alcoholic and water extract to 45 description is given.

Ayurvedic Pharmacopoeia of India Part II

Ayurvedic Pharmacopoeia of India part II includes Monograph of Ayurvedic Drug Formulation. In each Monograph definition of formulation, its ingredients with its Ayurvedic and equivalent botanical name, parts used and their ratio is described. The manufacturing process of formulation, description of product, for identification of ingredients microscopy, thin Layer Chromatography (TLC) and chemical tests are given. Physico-chemical parameters like loss on drying. Total Ash value, Acid insoluble Ash. Alcohol soluble extractives, water soluble extractive, pH etc. are given besides these indication, therapeutic use, dose, Anupana of that formulation is also described.

The following volume of Part II are published

Volume	Description
I	50 Monographs
II	51 Monographs
III	51 Monographs

Ayurvedic Formulary of India

It is published by Department of ISM & H, Ministry of Health and Family Welfare, Government of India in 1978. Printing of this brook is completed by NISCAIR, CSIR. Till now its 3 parts are published which is as follows:

Volume	Part Description
I	444 Formulations
II	191 Formulations
III	350 Formulations

It is three main divisions. In the beginning introduction is given

1. Formulary compound formulations
2. Formulary single drug
3. Appendices

Formulary Compound Formulation- In this section various formulation of different Kalpana are compiled in alphabetical sequences. The Asava and Arista are described first while Lauha in the last. In each of the section definition of that particular Kalpana its manufacturing method, Siddhi Lakshana preservation method, list of that formulation of that particular Kalpana then formulation description with references, it's ingredient their main, parts used and their amount in metric system, method of preparation, dosage and important therapeutic uses are described.

Formulary Single Drugs- In this section following list in given

1. List of single drugs of animal origin
2. List of single drugs of mineral origin
3. List of single drugs of plant origin
   a) As per names appearing in formulations
   b) As per botanical name

- The list contains the name of Dravya as appear in in the formulation, its official name and its English name.

Appendices- The following description of given :

1. Paribhasha (Glossary of Technical Terms)
2. Shodhanaa (Process of Detoxication)
3. Therapeutic Index
   a) Formula wise
   b) Disease wise
4. List of Disease/Technical terms and their approximate English equivalents
5. Metric equivalents of classical weights and measures
6. Bibliography

1. **Paribhasha** - It is divided into

(i) Samanya Paribhasha - Includes various terms like Anupana, Kajjali etc.

(ii) Kalpana Paribhasha- Description of different Kalpana

(iii) Puta Paribhasha- Definition of different Putas

(iv) Yantra Paribhasha - Description of Yantras.

2. **Shodhana-** In this chapter Shodhana of various Dravyas and Ashtasamskara of Parada is described.
3. **Therapeutic indices-** It is divided into two index. Formula wise index contain description of formulation in alphabetic order and their Rogadhikara is given while in Disease wise index alphabetic order of disease and formulation used in the disease in given.
4. It includes description of Disease in alphabetic order their equivalent technical terms along with English word.
5. In this Ayurvedic Mana and their equivalent metric measure is given.
6. In the Bibliography the list of books is given which are used for the compilation of Ayurvedic Formulary of India.

2 CHAPTER

Paribhasha (Terminology)

Syllabus

1. Definition and Importance of Paribhasha
2. Word Derivation- Aushadha, Bheshaja, Kalpana, Kashaya, Pancha Kashaya Yoni, Samskara
3. Dravya/Varga Paribhasha- (Classical Names, English names, Chemical Composition/ Formula) A) Rasa, Maharasa, Uparasa, Dhatuvarga, Upadhatu, Ratna, Uparatna, Sudhavarga, Sikatavarga, Lavanavarga, Visha, Upavisha, Kajjali, Mitrpanchaka, Dravaka Gana, B) Sandigdha(Contraversial): Vaikranta, Chapala, Rasanjana, Pushpanjana, Vahnijara, Girisindura, Kankushtha. C) Anupalabdha (Not Available): Rasaka, Sauviranjana D) Krutrima (Artificial): Sasyaka, Gandhaka, Kasisa, Rasanjana, Hingula E) Pratinidhi (Substitute) : Vajrabhave Vaikranta, Suvarna- Suvarna Makshika
4. Prakriya Paribhasha- A) Shodhanaa: Types of Shodhanaa, Samanya Shodhanaa, Vishesha Shodhanaa, Different techniques used for Shodhanaa, Swedana, Mardana, Dhalana, Nirvapa, Nirjaleekarana, Nimajjana, Bhavana,Bharjana B) Marana,: Definition, Importance of Marana, Types of Marana- Agnipaka Method, Putapaka Method, Kupipakwa Method, Bhanupaka Method, Swanga Sheeta C) Amrutikarana, Lohitikarana D) Sattvapatana, Shuddhavarta, Beejavarta E) Druti: Definition, Druti Lakshana F) Parada Samskara: Definition, Importance, Ashtasamskara Parada Jaranaa, Murcchana, Names of Parada-Bandhas
5. Pramanikarana Paribhasha (Terms for Standardization)- A) Grahy-Agrahyattva, Siddhilakshana B) Bhasma pariksha: Varitara, Rekhapurnata, Unama, Slakshnattva, Sukshma, Anjana Sannibha, Dantagrena, Kachakacha Bhavati, Varna, Avami, Apunarbhava, Niruttha, Gata Rasattva, Nischandrattva, Niramlattva, Nirdhumattva, Jihvagre adahyamanattva, Dadhi/ Nimbub Pariksha
6. Puraka Paribhasha (Supplementary)- Rudra Bhaga, Dhanvantari Bhaga
7. Mana-Paribhasha- A) Definition, Classical Types B) Classical and Modern- Conversion chart as per AFI, Scientific Metrology C) Essential Kala- mana.

Learning objectives

- Explain the term Paribhasha and its importance in Ayurvediya Aushadhi Nirmana.
- Describe the terms Aushadha, Bheshaja, Kalpana, Kashaya, Kashaya yoni, Samskara- based on their word derivation.
- Enlist sequentially - names of all drugs classified in the Varga (group). Recite shlokas of Maharasa, Uprasa, Sadharana Rasa Varga from Rasaratnasamuchchaya.
- Enlist and discuss Sandigdha, Krutrima, Pratinidhi and Anupalabdha Dravya.
- Describe the definition of the term Shodhana. Explain with examples different techniques used for the procedures of Shodhana.
- Explain the term Marana and describe its types with examples.
- Enlist all relevant Prakriya Paribhasha of Amrutikarana, Lohitikarana, Sattvapatana, druti and discuss with examples.

- Recite sequentially names of Parada Ashta samskara. Explain the terms Jarana Murcchana and cite types with examples. Compare Jarana and Murcchana.
- Identify names of Parada Bandhas.
- Describe Grahyagrahya parameters used for selection of Rasadravyas.
- Illustrate all Bhasma Pariksha as per classical description.
- Define the word Siddhilakshani. Recite examples of classical Siddhilakshani. Interpret its rationality.
- Recognise and discuss Dhanvantari Bhaga and Rudra Bhaga.
- Explain importance of Mana-Paribhasha and classical types of Mana. Recall Charts of Mana.
- Categorize parameters of Drug Standardization and develop a checklist for assessment of quality of Rasadravyas
- Explain Value of selection of genuine raw material
- Explain importance of ethical practices for drug processing (Shodhanaa, Marana)
- Discuss and justify importance of Bhasma Pariksha
- Explain value of keen and accurate application of weights and measures in Ayurvediya Aushadhi Nirmana.

Total - 12 hours (Lecture :08 hour, Non-lecture: 04 hours)

Marks- 10 marks, LAQ (10 Marks)- No, SAQ (5 Marks)- Yes, MCQ- Yes

In Bhaishajya Kalpana and Rasashstra, certain technical terms are often used. Explanation of these terms is called Paribhasha. Those interested in the details of Rasashastra and Bhaishajya Kalpana should be acquainted with the exact meaning of these technical terms. Some of which related to Rasashastra and Bhaishajya Kalpana are described here under. A statement of the exact meaning of a word or phrase etc. is known as definition or Paribhasha. The words, which are cryptic and ambiguous, are better understood with the help of Paribhasha. The literature of Rasashastra is very wide with several books written by stalwarts of the subject during different time period. Almost every other book written on the subject deals with the chapter Paribhasha which signifies its importance.

Definition and Importance of Paribhasha

अव्यक्तानुक्त लेशोक्त सन्दिग्धार्थ प्रकाशिकाः ।
परिभाषा प्रकथ्यन्ते दीपीभूताः सुनिश्चिताः ॥

(Vai. Pari. Pra.)

निगूढानुक्तलेशोक्तसन्दिग्धार्थप्रदीपिका ।
सुनिश्चितार्था विबुधैः परिभाषा निगद्यते ॥

(रसतरं. 2.2)

Paribhasha explains certain specific technical terminologies used throughout the subject and clarifies the different hidden, untold, half told and doubtful terms.

Paribhasha tells us about the Avyakta (unexpressed or hidden concept), Anukta (unspoken or unexplained), Leshokta (less explained concepts) and Sandigdha (controversial, difficult to understand) topics of subject certainly that are told in the texts.

Note- Avyakta (Not cleared) Anukta (Not said) Leshokta (Told partly) Sandigdha (Confusion between two) - Adhamalla, commentary of Sharangadhara Samhita told that Anukta = Aprakashita (अनुक्ते अप्रकाशिते). If method of any formulation is not cleared in during the description, then there should be method given according to Paribhasha should be followed. Ankukta Paribhasha is given well in the texts. Like if only the term Patra (Vessels) is written then it should be Mritika Patra (Earthen pot). In Rasashastra and Bhaishajya Kalpana a separate chapter is given showing the importance of Paribhasha.

Benefits of Paribhasha

ओषधानां विनिर्माणं सम्यक् चोपयोगं तथा।
परिभाषामविज्ञाय न कश्चित् कर्तुमर्हति ॥

Proper knowledge of preparation of medicines and accurate usage of medicines are the main benefits of knowing Paribhasha. Without knowing Paribhasha, one cannot formulate or administer any medicines in a right way.

2. Word Derivation- Aushadha, Bheshaja, Kalpana, Kashaya, Pancha Kashaya Yoni, Samskara

Aushadha

ओसो नाम रसः सोऽस्या धीयते यत्तदोषधिः।
ओसादारोग्यमाधत्ते तस्मादोषधिरोषधः ॥
(Kash. Khil. 3/27)

Oso is Rasa and by whom this Rasa is possess in known as Aushadhi the Arogya is achieved by this Rasa so who possess the Rasa is known as Aushadhi.

Bheshaja

भेषजौषध भैषज्यान्थगदो जायुरित्यापि ॥
(Amarkosha 2/6/50)

Aushadha, Bhaishjya, Agada and Jayu are name of Aushadha.

ओषधं द्रव्य संयोगं ब्रुवते दीपनादिकम्।
हुत व्रत तपोदानं शान्तिकर्म च भेषजम् ॥
(Kash.Ind. 5/4)

That is Dravya Samyoga used for Deepana etc. is known as Aushadhi, while Havana, Vrata, Tapa, Sana and various Shanti Karma comes under Bheshaja.

करणं पुनर्भेषजम् । भेषजं नाम तद्यदुपकरणायोपकल्पते भिषजो । धातु साम्याभिनिर्वृत्तौ प्रयतमानस्य विशेषत-श्चोपायान्तेभ्यः । तद्विविधं व्यपाश्रय भेदात्दैवव्यापाश्रयं, युक्तिव्यापाश्रयं चेति । (Cha. Ki. 8/87)

Karana is known as Bheshaja. Medicaments are those which are employed by physicians with a view to bringing about the equilibrium of Dhatus. These are used by the subject as instruments and include factors other than Karyayoni, Pravritti, Desha, Kala and Upaya.

Kalpana

- कल्प (कृप + अच् + घ ञ् वा) -Practicable (Vamana Shi. Apte p 258)
- कल्पनम् (क्लृच् + ल्युट) - To give form, to make
- कल्पनं उपयोगार्थ प्रकल्पनं संस्करणमिति । (Chakrapani)

So, Kalpana is defined as the process by which any drug (Aushadhi Dravya) is converted into suitable form so that it can be used practically.

Kashaya

कण्ठस्य कषणात् प्रायो रोगाणां वाऽपि कर्षणात् ।
कषाय शब्दः प्राधान्यात् सर्वयोगेषु कल्पयते ॥
(Kash.Khil 3/29)

Causing obstruction to the throat or irritating it and pulling the disease from body the word Kashaya is used predominantly to all the formulation.

The definition of word Kashaya in as follows :

द्रव्यादुद्धत सार भागः कषायः।
(Hemadri on Ash. Hri. Kalp. 6/8)

Kashaya is extracted essence part from Dravya.

Pancha Kashaya Yoni

पञ्च कषाय योनय इति मधुर कषायः, अम्ल कषायः, कटु कषायः, तिक्त कषायः कषाय कषायश्चेति तन्त्रे संज्ञा।
(Cha.Sutra. 4/6)

कषाय योनयः पञ्चरसा लवण वर्जिताः।
(Ash.Hri.Kalp. 6/8)

Kashaya Yoni are five in number and these are-

1. Madhura Kashaya
2. Amla Kashaya
3. Katu Kashaya
4. Tikta Kashaya
5. Kashaya Kashaya

Here Lavana Rasa is not included in Kashaya Yoni.

Samskara

संस्कारो हि नाम गुणान्तराधानमुच्यते । ते गुणास्तोयानि सन्निकर्ष शौच मन्थन देशकाल वासन भावनादिभिः कालप्रकर्ष भाजनादिभिश्चाधीयन्ते ॥ (Cha. Vi. 1/22)

Karana means the processing of the substances. Processing results in the transformation of the inherent attributes of substances. These properties are infused by contact of Toya (water) and Agni (fire), Shaucha (cleansing), Manthana (churning), Desha (storing), Kala (maturing), Vasana (flavoring), Bhavana (impregnation), Kala Prakarsha (preservation in container), Bhajana (frying process) etc.

Their use in Bhaishajya Kalpana (In various dosage form) is as follows :

Procedure	Kalpana
Jala Samskara- सुधौतः प्रस्रुतः स्विन्नः सन्तप्तश्चौदनो लघुः (सू.अ. 27)	Example- Rakta Shali after soaking in water and frying on fire becomes Laja (Guru Guna converts into Laghu Guna). Example- Kwatha, Phanta, Sneha etc.
Agni Samskara - तोयाग्निसन्निकर्षशौचैस्तण्डुलस्थं गौरवमुपहत्य लाघवमन्ने क्रियते।	Example- Tandula- after Agni Samskara Guru Guna of Tandula alters into Laghu Guna. Every Kalpana
Shaucha Samskara- Cleaning	Every Kalpana
Manthana Samskara- शोथकृद्दधि शोथघ्नं सस्नेहमपि मन्थनत इति।	Dadhi is Shothakara Dravya, but after Manthana Samskara the Takra Prayoga acts as Shothahara and Avaleha (mixing of Prakeshepaka Dravya)
Desha Samskara - भस्मराशेरधःस्थापयेत् -	In the preparation of Amalakavaleha or Amalaki Ghrita. Amalaki is to be kept in closed vessel and placed under heap of Bhasma Rashi. After six days it acquiring the Rasayana properties.
Vasana - Flavouring	Example Puspa Kalka Paka in Sneha Kalpana
Kala Prakarsha - पक्षाज्जातरसं पिबेत् (चि.अ. 15)	After keeping for 15 day (for Asava and Arishta preparation) it becomes fermented because of Kala Prakarshiti.
Bhajana Samskara - त्रैफलेनायसींपात्रींकल्के-नालेपयेत् (चि.अ.1.पा.3)	Triphala Kalka Lepa to be done in Loha Patra provides Rasayana effect.

Note- The properties of Dravya can be altered by Samskaras and this concept is applicable in Bhaishajya Kalpana where Aushadha Dravya are converted into various dosage form by using the Samskara.

3. Dravya/Varga Paribhasha- (Classical Names, English names, Chemical Composition/ Formula)

Rasa

Classical name-Parada, Rasa

English name- Mercury

Chemical Formula- Hg

In Sanskrit language, there are many meaning of the word Rasa. These can be enumerated as liquid and taste. In Sanskrit it is explained as रसनात् सर्वधातूनां रस इत्यभिधीयते. Another explanation is again जरारुङ्मृत्युनाशाय रस्यते वा रसो मतः. The verb रस्यते means is ingested or taken internally.

However, as has been stated earlier, in this science, the word Rasa means mercury. It seems that there are two reasons for naming Mercury as Rasa. The first is it is the only metal which is in liquid form at room temperature and it has unique property to mix intimately with other metals and

still maintaining the liquidity i.e. as if it liquifies other metals and mixes with them.

Maharasa

अभ्रवैक्रान्तमाक्षीकविमलाद्रिजसस्यकम् ।
चपलो रसकश्चेति ज्ञात्वाऽष्टौ संग्रहेद्रसान् ॥
(R.R.S. 2/1)

Abhraka, Vaikrant, Makshika, Vimal, Adrija, Sasyaka, Chapala and Rasaka these eight are Maharasa.

Dravya	Classical name	English name	Chemical/ Composition Formula
Abhraka	Abhraka	Biotite Mica	$K(Mg,Fe)_3 AlSi_3O_{10} (F,OH)_2$
Vaikrant	Vaikrant	Tourmaline	$(Ca,K,Na)(Al,Fe,Li,Mg,Mn)_3 (Al,Cr,Fe,V)_6 (BO_3)_3 (Si,Al,B)_6O_{18} (OH,F)_4$
Makshika	Makshika	Pyrite	$CuFeS_2$
Vimal	Vimal	Iron Pyrite	Fe_2S_3
Adrija	Adrija	Mineral pitch	KNO_3
Sasyaka	Sasyaka	Blue vitrol	$CuSO_4.5H_2O$
Chapala	Chapala	Bismuth ore	Bismuth ore
Rasaka	Rasaka	Zinc ore	Zns, ZnO, $ZnCO_3$

Uparasa

गन्धाश्मगैरिकासीसकांक्षीतालशिलाञ्जनम् ।
कङ्कुष्ठं चेत्युपरसाश्चाष्टौ पारदकर्मणि ॥
(R.R.S. 3/1)

The eight Uparasa Dravyas that are used in Parada Karma are- Gandhaka, Gairika, Kasisa, Kankshi, Hartala, Manashila, Anjana, Kankushtha.

Dravya	Classical name	English name	Chemical/ Composition Formula
Gandhaka	Gandhaka	Sulphur	S
Gairika	Gairika	Ochre	Fe_2O_3
Kasisa	Kasisa	Green Vitrol	$FeSO_4.7H_2O$
Kankshi	Kankshi	Alum	$K_2SO_4.Al_2(SO_4)_3\ 24H_2O$
Hartala	Hartala	Yellow arsenic	$As2S_3$
Manashila	Manashila	Realgar	$As2S_2$
Anjana	Anjana	Collyrium	
Kamkushtha	Kamkushtha	Gambose three (Rhubarb)	Resin of Garcinia Morella

Sadharana Rasa

कम्पिल्लश्चपरो गौरीपाषाणो नवसारकः ।
कपर्दो वह्निजारश्च गिरिसिन्दूरहिङ्गुलौ ॥
मृद्दारशृङ्गमित्यष्टौ साधारणरसाः स्मृताः ।
रससिद्धिकराः प्रोक्ता नागार्जुनपुरःसरैः ॥
(R.R.S. 3/120-21)

Kampillaka, Gauripashana, Navasarka, Kapard, Vahinjara, Giri Sindoora, Hingula and Mriddarshringa are Sadharana Rasa.

Dravya	Classical name	English name	Chemical/ Composition Formula
Kampillaka,	Kampillaka,	Kamala tree	Rottlerin, Kamalins I & II etc.
Gauripashana	Gauripashana	White Arsenic	$AS2O_3$
Navasarka	Navasarka	Ammonium chloride	NH4Cl
Kapard	Kapard	Cowry	CaCO3
Vahinjara	Vahinjara	Ambargris	-
Giri Sindoora	Giri Sindoora	Red oxide of mercury	HgO
Hingula	Hingula	Cinnabar	HgS
Mriddarshringa	Mriddarshringa	Litharge	PbO

Dhatuvarga

वलीपलितखालित्य काश्र्यबल्यजरामयान् ।
निवार्य दधते देहं नृणां तद्धातवो मताः ॥
(A.P. 3/2)

As these are used to mitigate Vali, Palita, Khalitya, Karshya, Abalya and Jara disease and provide nourishment and strength the body these are known as Dhatu.

शुद्धं लोहं कनक रजतं भानुलोहाश्मसारम्।
पूतीलोहं द्वितयमुदितं नागवङ्गाभिधानम्॥
मिश्र लोहं त्रितयमुदितं पित्तल कांस्यवर्तम्।
(R.R.S. 5/1)

1. Shuddha Loha (4)- Kanaka (Au)
   Rajata (Ag)
   Bhanu Loha (Cu)
   Ashmasara (Fe)
2. Puti Loha (2)- Naga (Pb)
   Vanga (Sn)
3. Mishra Loha(3)- Pittala (Brass)
   Kamsya (Bronze)
   Varta loha

Total Nine Dhatus are said in three groups

Dravya	Classical name	English name	Chemical/ Composition Formula
Swarna	Kanaka	Gold	Au
Rajata	Rajata	Silver	Ag
Tamra	Bhanu Loha	Copper	Cu
Laha	Ashma-sara	Iron	Fe
Naga	Naga	Lead	Pb
Vanga	Vanga	Tin	Sn
Pital	Pittala	Brass	Cu+Zn
Kamsya	Kamsya	Bronze	Cu+Sn
Varta	Varta	-	Cu+sn+Zn Fe
Loha	loha		+Pb

Upadhatu

ताप्यं च विमला तुत्थं कांस्यं पित्तलकं तथा।
सिन्दूरं शैल निर्यासः स्मृता सप्तोपधातवः॥
(A.P. 3/5)

1. Tapya, 2. Vimal, 3. Tuttha, 4. Kamsya, 5. Pittala, 6. Sindoora, 7. Shaila Niryasa (Shilajatu), These seven are Upadhatu.

Dravya	Classical name	English name	Chemical/ Composition Formula
Tapya	Tapya	Pyrite	CuFeS2
Vimal	Vimal	Iron pyrite	Fe2S3
Tuttha	Tuttha	Blue vitrol	CuSO4.7H2O
Kamsya	Kamsya	Bronze	Cu+Sn
Pittala,	Pittala,	Brass	Cu+Zn
Sindoora	Sindoora	Red oxide of	HgO
Shaila Niryasa (Shilajatu)	Shaila Niryasa (Shilajatu)	Mineral pitch	

Ratna

माणिक्य मुक्ताफलविद्रुमाणि तार्क्ष्यञ्च पुष्यं भिदुरञ्च नीलम्।
गोमेदकञ्चाथ विदूरकञ्च, क्रमेण रत्नानि नवग्रहाणाम्॥
(R.R.S. 4/5)

The Nine Ratnas are as follows :

1. Manikya, 2. Muktaphala, 3. Vidruma, 4. Tarksya, 5. Pushpa, 6. Bhidura, 7. Neelama, 8. Gomeda, 9. Vaidurya.

Dravya	Classical name	English name	Chemical/ Composition Formula
Manikya	Manikya	Ruby	Al2O3
Moti	Mukta-phala	Pearl	CaCO3
Pravala	Vidruma	Coral	CaCO3
Panna	Tarksya	Emerald	Be3Al2 (SiO3)6
Pukharaj	Pushpa-raga	Topaz	Al2SiO4 (F.OH)2
Heera	Bhidura	Diamond	C
Neelama	Neelama	Sapphire	Al2O3
Gomeda	Gomeda	Zircon	Fe3Al2 (SiO4)3
Vaidurya	Vaidurya	Cat's Eye	BeOAl2O3

Uparatna

वैकान्तं सूर्यकान्तश्च चन्द्रकान्तो नृपोपलः।
पेरोजकञ्च स्फटिकं क्षुद्ररत्नगणो ह्यम्॥
(R.T. 23/154)

Vaikranta, Suryakanta, Chandrakanta, Nripopala, Perojaka and Sphatika are Uparatnas.

Dravya	Classical name	English name	Chemical/ Composition Formula
Vaikranta	Vaikranta	Tourmaline	(Ca,K,Na,ţ%) (Al,Fe,Li,Mg, Mn)$_3$ (Al,Cr,Fe, V)$_6$ (BO$_3$)$_3$ (Si,Al,B)$_6$O$_{18}$ (OH,F)$_4$
Suryak-anta	Suryak-anta	Sunstone	[Na,Ca]{Al (Si,Al)Si,Al) Si2O8ue
Chandr-akanta	Chandr-akanta	Moon stone	KAlSi3O8 / NaAlSi2O8
Rajavarta	Nripopala	Lapis laxzuli	Na4(NaS3Al) Al2(SiO2)3
Phiroja	Perojaka	Turquise	CuAl6(PO4) 4(OH)8.4H2O
Sphatika	Sphatika	Quartz	SiO2

Sudhavarga

According to origin these are classified as below.

1. Animal source- Kaparda, Shukti, Shankha, Mrigashringa, Samudraphena, Kukutanda Twaka.
2. From earth- Shudha, Khatika, Godanti

Dravya	Classical name	English name	Chemical/ Composition Formula
Kaudi	Kaparda	Cowery	CaCO3
Shukti	Shukti	Ooyster	CaCO3
Shankha	Shankha	Conch shell	CaCO3
Mrigas-hringa	Mrigas-hringa	Deer horn	CaPO4
Samudr-aphena	Samudr-aphena	Cuttle fish bone	CaCO3
Kukuta-nda Twaka	Kukuta-nda Twaka	Hen's egg shell	CaCO3
Shudha	Shudha	Lime	CaCO3
Khatika	Khatika,	Chalk	CaCO3
Godanti	Godanti	Gypsum	$CaSO_4 2H_2O$

Siktavarga

In this Varga, Sikta, Dugdha Pashana, Naga Pashana/Jaharmohra, Badrashma, Vyomashma, Kausheyashma and Akika are included. These all are having silica or silicates.

Dravya	Classical name	English name	Chemical/ Composition Formula
Sikta	Sikta	Silica	SiO2
Dugdha Pashana	Dugdha Pashana	Talc	Mg3Si4O10 (OH)2
Jaharm-ohra	Naga Pashana	Serpentine	(Mg6(SiO10) x(OH)8)
Badras-hma	Badras-hma	Silicate of lime	
Vyoma-shma	Vyoma-shma	Jade	NaAlSi2O6
Kaushe-yashma	Kaushe-	Asbestos	yashma
Akika	Akika	Agate	

Lavanvarga

सैन्धवाञ्चाथ सामुद्रं विडं सावैर्चलं तथा।
रोमकञ्चेति विज्ञेयं बुधैर्लवणपञ्चकम्॥
(R.T. 2/3)

Saindhava (Rock salt), Samudra (Sea salt), Vida Lavana, Sauvarchala (Black salt) and Romaka Lavana are known as Lavana Panchaka.

Dravya	Classical name	English name	Chemical/ Composition Formula
Saindhava Lavana	Saindhava Lavana	Rock salt	NaCl-97.68% w/w NaHCO3-0.07%
Samudra Lavana	Samudra Lavana	Sea salt	NaCl-91.39% Na2S-0.121% w/w
Vida Lavana	Vida Lavana		NaCl-91.77% w/w

Sauvar-chala Lavana	Sauvar-chala Lavana	Black salt	NaCl-97.82% w/wNa2S-0.918% w/w
Romaka Lavana	Romaka Lavana		NaCl-97.11% Na2S-0.060% w/w

Visha

शृङ्गीकं कालकूटञ्च वत्सनाभञ्च सक्तुकम्।
पित्तञ्च विषवर्गोऽयं स वरः परीकीर्तितः॥
(R.R.S. 10/82)

1. Shringaka, 2. Kalkuta, 3. Vatsnabha, 4. Saktuka and 5. Pitta comes under Visha Varga.

Vatsnabha

Classical name- Vatsnabha

English Name- Aconite

Phytochemicals- Aconitine, Pseudo-Aconitine, Bikhaconitine, Chasmaconitine, Indaconitine, Catecholamine and Isoquinolines.

Upavisha

विषतिन्दुक बीजं च त्वहिफेनञ्च रेचनम्।
धत्तूरवीजं विजया गुञ्जा भल्लातकाह्वयः॥
अर्कक्षीरं स्नुहीक्षीर लाङ्गली करवीरकम्।
समाख्यातो गणोऽयं तु बुधैरुपविषाभिधः॥
(R.T. 24/163-64)

Vishatinduka seed, Ahiphena, Jaipala, Dhatura seed, Vijaya, Gunja, Bhallataka, Arka Ksheera, Snuhi Ksheera, Langli and Karveera are eleven Upavisha.

Dravya	Classical name	English name	Chemical/ Composition Formula
Kuchala	Vishatin-duka	Poison nut tree	Brucine, Stry-chnine etc.
Aphima	Ahiphena	Opium	Morphine, Codein etc.
Jaipal	Jaipala	Croton	linoleic acid, oleic acid and elcosenoic acid.
Dhatura	Dhatura	Thorn apple	Daturadiol etc.
Bhanga	Vijaya	Indian Hemp	Cannabiol etc.
Gunja	Gunja	Jequirity	Abrine, Aloridin etc
Bhalla-taka	Bhalla-taka	Marking Nut Tree	Anacardica acid etc.
Madar	Arka Ksheera	Madar	Calactin, Calotropin
Snuhi	Snuhi Ksheera	Milk Hedge	Euphol, Nerifoliol etc.
Langli	Langli	Glory Lily	Colchicine, Puteolin
Kanera	Karveera	Oleander	Karabin, Neri-odorein etc.

Kajjali

- निर्द्रवैर्धातुभिश्चाथ गन्धादिभिः पेषितः पारदः श्लक्ष्णतां प्रापितः। कज्जलाभो यदा जायतेऽसौ तदा नामतः कोविदैः कज्जलीत्युच्यते॥ (R.T. 2/27)

When Gandhaka is added to Parada and triturated without adding any liquid till it becomes a very fine black powder. It is called Kajjali.

अर्द्धसमानद्विगुणमिताद्या गन्धकचूर्णात् पारदकस्य।
मर्दनजन्या मृसणकाया कज्जलह्वपा कज्जलिका सा॥
(R.T. 6/107)

Kajjali can be prepared by taking Gandhaka in half, equal, double etc. part to that of Parada.

Mitrpanchaka

आज्यं गुञ्जाथ सौभाग्यं क्षौद्रं च पुरसंज्ञकम्।
एतत्तु मिलितं विज्ञैर्मित्रपञ्चकमुच्यते॥
(R.T. 2/37)

Ghrita, Gunja (Abrus precagtorius), Saubhagya (Tankana), Honey and Pura (Commiphora wightii) are collectively known as Mitra Panchaka.

Use- It is used in Apunarbhava and Satvapatana process.

Dravya	Classical name	English name	Chemical/ Composition Formula
Ghrita	Ghrita	Ghee	Fatty acid (Saturated)
Gunja	Gunja	Jequirity	Abrine, Abridin

Tankana	Saubha-gya	Borax	NO2B4O7.10 H2O
Madhu	Kshaudra	Honey	Mix of fruct-ose-glucose,
Pura	Guggulu	Indian Bedellium	Contain diterpenoids, triterpinoids

Dravaka Gana

गुञ्जा मधु गुडः सर्पिः सौभाग्यं गुग्गुलुस्तथा।
पूर्वाचार्यैः कीर्तितोऽयं धातूनां द्रावको गणः॥
(R.T. 2/35)

Gunja (Abrus precatorius), Honey, Guda (Jaggery), Ghrita, Tankana and Guggulu (Commiphora wightii) are collectively known as Dravaka Gana by the Acharyas of Rasa Shastra.

Dravya	Classical name	English name	Chemical/ Composition Formula
Ghee	Ghrita	Ghee	Fatty acid (Saturated)
Gunja	Gunja	Jequirity	Abrine, Abridin
Tankana	Saubh-agya	Borax	NO2B4O7.10 H2O
Madhu	Kshaudra	Honey	Mix of fruct-ose-glucose,
Pura	Guggulu	Indian Bedellium	Contain dite-rpenoids, triterpinoids
Guda	Guda	Jaggery	Sucrose

B) Sandigdha (Controversial): Vaikranta, Chapala, Rasanjana, Pushpanjana, Vahnijara, Girisindura, Kankushtha.

Vaikranta

There is difference of opinion to its modern contemporary Dravya. Fluorspar, Felspar, Rock crystal, Quartz and Tourmaline are compared with Vaikranta. Ayurvedic Pharmacopoeia of India has accepted Tourmaline as Vaikranta.

Chapala

वङ्गवत्द्रवते बह्नौ चापलस्तेन कीर्तितः।
(R.R.S. 2/143)

It is called Chapala because it melts at low temperature like Vanga (Tin metal). In the present time there is difference of opinion regarding Chapala to its modern counterpart. In the commentary of Rasa Tarangini Selenium is accepted while Acharya Dattatreya Anant Kulkarni opines it as Bismuth ore.

Rasanjana

Rasanjana is considered to be a controversial drug. Ayurveda Prakash has mentioned that it is two types. One is Shailaja i.e. procured from hills and other is Kritrima. Acharya D.A. Kulkarni has mentioned that Rasanjana is yellow oxide of mercury which is a mineral obtained in nature in small quantities. Now a days the Kritrima variety is used that is prepared by the Ghana of Berbaris aristata. The Kitta obtained by heating of Riti (Brass) is also known as Rasanjana.

Pushpanjana

It is also a controversial material. The various opinion regarding it are as follows-

1. Anjana obtained from Pushpa (Kashmiri Honey procured from flowers).
2. Anjana prepared from Pushpa Kasisa.
3. According to Ayurveda Prakash it is prepared from Riti Kitta.
4. Fulla Tuvari is also known as Pushpanjana.

Rasa Tarangini has described it as follows

रीतिका द्रावण विधौ रीतिस्थं यशदं द्रुतम्।
समेत्यम्बर पीयूष योगेन सित चूर्णताम्॥
तदेवसितचूर्णन्तु पुष्पाञ्जनमुदीरितम्।
भस्त्राध्मातं पुष्पितं तु यशद वा तदाह्वयम्॥
(R.T. 22/49-50)

During the melting process of Riti (Brass), Zinc present in this reacts with atmosphere's oxygen and became powder of white colour. This white colour powder is known as Pushpanjana or only Yashad

is when roasted in strong heat then its calyx (Pushpa) is formed it is known as Pushpanjana.

Vahinjara

When the Jarayu of foetus of Agninakra, a sea animal, is dried due to sun rays and taken to sea shore through sea waves is termed as Agnijara.

According to modern view it is dried faecal matter found in the intestine of whale fish. Which comes out from the intestine of dead whole fish after some times. Because it is very light so it floats on sea water and it is dried by sunrays then it is known as Ambar.

Girisindura

It is found in between the rocks of big mountains which may be a mercury oxide compound known as Giri Sidoor. "Montraodite" the mineral of mercury corelated with it.

Kankushtha

Since ancient times Kankushtha is a controversial drug. Various opinion regarding it are as follows:

- According to Bhaluki it is an ore of Tin mineral.
- As per Rasarnava it is bright red in colour like Vidruma (Coral).
- According to Dalhana it is Kanchan Ksheeri or Svarn Ksheeri (Dalhana commentary Su.Chi. 38/29-30).
- According to Adhamalla it is Svarnksheeri (रक्तक्षीर सेहुण्ड इति प्रतीते)
- Acharya Yadav ji has consider it as Gambose or Revand Chini
- Pandit Shaligram has accepted as Mriddarshringa.
- Rasa Ratna Samuchchaya has described it as follows.

केचिद्वदन्ति कङ्कुण्ठं सद्योजातस्य दन्तिनः ।
वर्चश्च..... ॥
कतिचित्तेजिवाहानां नालं कङ्कुष्ठ संज्ञकम् ॥
(R.R.S. 3/111-12)

Some scholars say that it is a faecal matter of newly born elephant child. Other told that it is a part of umbilicus of a newly born horse child.

Now a days it is taken as secretion of Tamal tree or Mysore Gambose tree (Garcinia morella), which after some times from its procurement gets solidified and became Churna like. It is yellow in colour and possess Virechana property.

C) Anupalabdha (Not Available): Rasaka, Sauviranjana

Rasaka

It is controversial drug of Rasashastra. Some scholars consider Tuttha (Sasyaka) verity as Rasaka. Some consider Rasaka as one of the synonyms of Yashada (zinc) but upon scrutinizing the Shastras, it can be definitively said that it is a compound of Yashada

Sauveeranjana

- Sb_2S_3 (According to Aacharya DA Kulkarni)
- PbS (As per Ayurvedic Pharmacopoeia of India)

D) Krutrima (Artificial): Sasyaka, Gandhaka, Kasisa, Rasanjana, Hingula

Now a day these are available from laboratory so these are termed as Krutrima (Artificial).

Sasyaka

- Dravya Name- Sasyaka
- Sanskrit Name- Sasyaka
- English Name- Blue vitrol
- Chemical/ Composition Formula- $CuSO_4 \cdot 5H_2O$

Gandhaka

- Dravya Name- Gandhaka
- Sanskrit Name- Gandhaka
- English Name- Sulphur
- Chemical/ Composition Formula- S

Kasisa

- Dravya Name- Kasisa

- Sanskrit Name- Kasisa
- English Name- Green Vitrol
- Chemical/ Composition Formula- FeSO4. 7H2O

Rasanjana

Rasanjana is considered to be a controversial drug. Ayurveda Prakash has mentioned that it is two types. One is Shailaja i.e. procured from hills and other is Kritrima. Acharya D.A. Kulkarni has mentioned that Rasanjana is yellow oxide of mercury which is a mineral obtained in nature in small quantities. Now a days the Kritrima variety is used that is prepared by the Ghana of Berbaris aristata. The Kitta obtained by heating of Riti (Brass) is also known as Rasanjana.

Hingula

- Dravya Name- Hingula
- Sanskrit Name- Hingula
- English Name- Cinnabar
- Chemical/ Composition Formula- HgS

E) Pratinidhi (Substitute): Vajrabhave Vaikranta, Suvarna- Suvarna Makshika

Vajrabhave Vaikranta- Vaikranta is taken in place of Vajra.

Suvarna-Suvarna Makshika- Swarna Makshika is used in place of Swarna.

4. Prakriya Paribhasha

A) Shodhana: Types of Shodhana, Samanya Shodhana, Vishesha Shodhana, Different techniques used for Shodhana, Swedana, Mardana, Dhalana, Nirvapa, Nirjaleekarana, Nimajjana, Bhavana, Bharjana

Shodhana

उद्दिष्टैरौषधैः सार्धः क्रियते पेषणादिकम्।
मलविच्छित्तये यत्तु शोधनं तदिहोच्यते॥
(R.T. 2/52)

Shodhana is the process which is done to remove the impurities (Mala) from a Dravya by doing the process like grinding, rubbing, steaming etc. and using specific herbs for this process.

निर्दिष्टैरौषधैः सार्द्धं पेषणं स्वेदनादिकम्।
दुष्टं दोषविनाशाय शोधनं परिकीर्तितम्॥
(Rasamitra)

The act of treating a substance with advised matter by rubbing, steaming etc. so as to remove bad properties, it is known as Shodhana.

Note- In Ayurvedic formulary of India volume I Shodhana is defined as the process of removal of impurities and potentization of drugs. The word Shodhana normally denotes the process to remove the impurities or Mala. But in the Rasa Shastra Shodhana also fulfil the following objectives-

- Removal of impurities- For example Shodhana of Parada, Gandhaka etc.
- For Bhasma preparation- As in case of Dhatu. Here by Shodhana process the metal is divided into small pieces so that Marana process is facilitated.
- To reduce the toxicity- By the process of Shodhana the toxicity of Visha Dravya's is reduced so that these can be used as medicine

Types of Shodhana

Samanya Shodhana- These are the process that can be done for a group of Dravyas. Few examples are described below-

सूर्यावर्तककदली वन्ध्या कोशातकी च सुरदाली।
शिग्रुश्च वज्रकन्दो नीरङ्कणा काकमाची च॥
आसामेकरसेन तु लवणक्षाराम्लभाविता बहुशः।
शुद्ध्यन्ति रसोपरसा ध्माता मुञ्चन्ति सत्त्वानि॥
(R.R.S. 3/118-19)

When Rasa and Uparasa is Bhawita with either of Svarasa of Suryavartaka, Kadali Vandhya Karkoti, Deodali, Shigru, Vajra Kand, Pippali and Makoya, mixed with Lavana, Kshara and Amla Dravya and this process is done for more than one time then these Dravya are being Shodhita and their Satva can be obtained.

साधारणरसाः सर्वे मातुलुङ्गार्द्रकाम्बुना।
त्रिरात्रं भाविताः शुष्का भवेयुर्दोषवर्जिता॥
(R.R.S. 3/147)

When Sadharana Rasas are Bhawita with juice of Matulunga, Nimbu Svarasa for three days and then it is dried. By doing this process all Sadharana Rasa become free from impurities.

तैले तक्रे गवां मूत्रे ह्यारनाले कुलत्थजे।
क्रमान्निषेचयेत्तप्तं द्रावे द्रावे तु सप्तधा॥
स्वर्णादि लोह पत्राणां शुद्धिरेषा प्रशस्यते॥
(R.R.S. 5/13)

When thin foil of Swarna, Rajata etc. metals are heated till red hot and then dipping into Taila (Tila Taila), Takra, Cow's urine, Aarnal and Decoction of Kullatha for seven times in each of the five liquids then these become pure i.e. free from impurities.

Vishesha Shodhana

When Shodhana process is done for a particular Dravya then it is known as Vishesha Shodhana.

For example-

कर्षप्रमाणं तु सुवर्णपत्रं शरावरुद्धं पटुधातुयुक्तम्।
अङ्गारसंस्थं प्रहरार्धमानं ध्मातेन तत्स्यान्ननुपूर्णवर्णम्॥
(R.R.S. 5/12)

When one Karsha gold foil in mixed with Saindhava Lavana and kept into Sharava Samputa then subjected to heat of coal for half Prahara then gold attains its full colour.

Here different method of Shodhana and their examples are given-

Avapa	Vanga Jarana
Nirvapa	Samanya Shodhana of metals
Dhalana	Gandhaka Shodhana
Bhavana	Kasisa, Gairika etc Shodhana
Bharjana	Gairika Shodhana
Atapa	Vatsnabha Shodhana
Swedana	Shodhana of Ratna
Marana	Shodhana of Parada
Galana	Shodhana of Khatika
Patana	Shodhana of Parada
Prakshalana	Shodhana of Parada
Nirjalikarana	Shodhana of Tankana, Sphatika

Different techniques used for Shodhana

Swedana

क्षाराम्लैरौषधैर्वाऽपि दोलायन्त्रे स्थितस्य हि।
पचनं स्वेदनाख्यं स्यान्मलशौथिल्यकारकम्॥
(R.R.S. 8/59)

With the help of Kshara, Amal and herbs like Rajika. Saindhava Lavana when Parada is being subjected to Dola Yantra and Pachana is done then this is known as Swedana. Swedana results into loosening of Mala.

Mardana

उदितैरोषधैः सार्धं सर्वाम्लैः काञ्जिकैरपि।
पेषणं मर्दनाख्यं स्याद्विहिर्मलविनाशनम्॥
(R.R.S. 8/60)

The trituration of Parada done by said Dravyas and Kanji is known as Mardana. It removes the Vahirmala of Parada. Mardana Samskara is done in Taptva Khalva Yantra.

Dhalana

संद्रावितस्य द्रव्यस्य द्रवे निक्षेपणन्तु यत्।
ढालनं तत्समुद्दिष्टं रस कर्म विशारदैः॥
(R.R.S. 2/36)

When melted Dravya is poured into liquid then this process is known as Dhalana by experts of Rasa Karma i.e. Rasa shastri.

द्रुत द्रव्यस्य निक्षेपो द्रवे तद् ढालनं मतम्।
(R.R.S. 8/40)

The process is used for Shodhana of Gandhaka.

Nirvapa

तप्तस्याप्सु विनिक्षेपो निर्वापः स्नपनं च तत्॥
(R.R.S. 8/54)

When metal is heated up to red hot and then it is quenched into any liquid then this process is known as Nirvap Snapana is synonym for Nirvap. This process is used in Samana Shodhana of Dhatus. According to Rasa Tarangini the word Nisheka also used for this process.

Example of Nirvapa

तैले तक्रे गवां मूत्रे ह्यारनाले कुलत्थजे।
क्रमान्निषचयेतप्ते द्रावे द्रावे तु सप्तधा॥
(R.R.S. 5/12)

Nirjalikarana- The Process of removing water or evaporation is known as Nirjalikarana.

This Process is used in the Shodhana of Sphatika (Alum), Tankana (Borax). These Dravyas are heated in an iron pan so that water is evaporated.

Nimajjana-Dipping of drug into any liquid is termed as Nimajjana. This Process is used for Shodhana of Vatsnabha where the small pieces of Vatsnabha (Chanaka sized) are dipped into Gomutra and kept in sunlight for three days.

Bhavana

यच्चूर्णितस्य धात्वादेर्द्रवैः सम्पेष्य शोषणम्।
भावनं तन्मतं विज्ञैर्भावना च निगद्यते॥
(R.T. 2/49)

Bhavana is the process by which powders of drugs are ground to a soft mass with liquid substances and allowed to dry.

For example- Shodhana of Gairika with cow milk.

Here the characteristic of Subhavita and Durbhavita is described.

Subhavita

पेष्यमाणञ्च यद् द्रव्यं चिपिटीभूय चूर्णताम्।
याति मार्दवयुक्तत् सुभावितमुदाहृतम्॥
(R.T. Comm. 2/51)

On grinding when Bhavita Dravyas becomes Chiptibhuya i.e. flat and it is soft. On having these character it is known as Subhavita.

Durbhavita

यत् पिष्टं सहसादीर्णं खर स्पर्शन्न कोमलम्।
तद्दुर्भावितमित्युक्तं भावनावेदिभिर्जनै॥
(R.T. Comm. 2/51)

When on grinding the Bhavita Dravya suddenly breaks and it is rough on touch then it is known as Durbhavita.

Bharjana- Frying of any drug into Sneha is known as Bharjana. This process is used for the Shodhana of Gairika where it is fried into Goghrita.

B) Marana: Definition, Importance of Marana, Types of Marana- Agnipaka Method, Putapaka Method, Kupipakwa Method, Bhanupaka Method, Swanga Sheeta

Marana

विविधक्रमयोगेन गन्धकाद्यौषधैः सह।
रसादीनाञ्च धातूनां रोगापनयनक्षमम्॥
गन्धकादि युतं वापि यदम्बर सुधान्वितम्।
भस्मत्वापादनं यत्तु मारणं तदिहोच्यते॥
(R.T. 7/1-2)

By doing different steps and adding Gandhaka and other herbs Rasadi Dravya and metals are being made to capable of killing disease or with the help of Gandhaka or oxygen (Amber Sudha) the Rasa Dravyas and metals are converted into Bhasma form this process is known as Marana.

Note- The different steps involved in Marana process are as follows-

1. Bhavana of Shodhita Dravya
2. Chakrika preparation
3. Drying of Chakrika
4. Sharava Samputa
5. Puta (Appropriate application of heat)
6. Swang Sheeti Karana (Self cooling)
7. Powdering of Chakrika

These are various steps for the process of single Puta. This process is repeated unless Bhasma is prepared.

Importance of Marana-Rasadi Dravya and metals are being made to capable of killing disease or with the help of Gandhaka or oxygen (Amber Sudha) the Rasa Dravyas and metals are converted into Bhasma.

Types of Marana

Agnipaka Method- When Drava is kept in

vessel and it is kept over fire it is known as Agni Paka.

Putapaka Method- Incineration of metals in heat of Upla is known as Putapaka.

Kupipakwa Method- Paka of the Dravya like Parada, Gandhaka after keeping these into Kupi (Kancha Kupi) is known Kupi Paka. Rasa Sindoora, Malla Sindoora etc. are made by Kupi Paka. In this process specific temperature pattern is followed.

Bhanupaka Method

वराक्वाथ युतं लौहं भानौः प्रखर भानुभिः।
शुष्यन् विपच्यते यस्माद् भानुपाकस्ततः स्मृतः॥
(R.T. 20/21)

In a vessel Triphala Kwatha is taken and Loha is dipped into it. Now it is kept in strong sun rays for drying. This process is known as Bhanupaka.

Swanga Sheeta

बहिस्थमेव शीतं यत्तदुक्तं स्वाङ्ग शीतलम्।
(R.RS. 8/58)

The process of self-cooling after the process of Agni Paka is known as Swanga Sheeta. In this process Musha into which Dravya is kept is not taken out from Agni.

C) Amrutikarana, Lohitikarana

लोहादीनां मृतानां वै शिष्टदोषापनुत्तये।
क्रियते यस्तु संस्कार अमृतीकरणं मतम्॥
(R.T. 2/58)

Amrtikarana is process (Samskara) adopted to remove the residual Doshas and to enhance the therapeutic action of drugs.

Note- This process is especially done for Tamra and Abhraka. The process of Abhraka is as follows-

मृताभ्रसंमितं गव्यमाज्यं दत्वाभ्रक पचेत।
अमृतीकृतमेवन्तु घनं कार्येषु योजयेत्॥
(R.T. 10/71)

Abhraka Bhasma and cow's Ghrita is taken into equal quantity in a Lauha vessel then it is heated when Ghrita is completely disappear. This is Amritikrita Bhasma and used in all purposes.

Note- Ayurveda Prakasha has said Amritikarana as Samskar by which the quality of Bhasma is increased but its colour in loss.

अथैवं मृतस्याभ्रकस्यामृतीकरणाख्यः संस्कार उक्तः।
अरूण भस्मनस्तु पुनस्मृतीकरणेन गुणवृद्धिर्वर्णहानिश्च भवति॥
(A.P. 2/135)

Lohitikarana

This process is especially done with Abhraka Bhasma. When the colour of Abhraka Bhasma does not become red after puta process then by giving the Bhavana of some specific drug following puta process the red colour is attained to Abhraka Bhasma. The herbs are as follows-

गाङ्गेरूकी भद्रमुस्ता वटक्षीरन्तथैव च।
वटमूलजलं वापि हरिद्राया द्रवस्तथा॥
समङ्गाक्वथितञ्चैव घनमेभिः सुपेषयेत्।
पुटद्वयं त्रयं वापि वितरेद्भिषजां वरः॥
निश्चान्द्रिकञ्च मृदुलं रक्तोत्पलसमप्रभम्।
गगनस्य भवेद्भस्म ततः कार्येषु योजयेत्॥
(R.T. 10/65-67)

Abhraka Bhasma is grinded (Bhavita) with the liquid of (Swarasa/Kwatha) of said drugs then it is subjected to two or three Putas after giving Puta the obtained Bhasma of Nischandra, Mridu (Soft) and colour of Raktotpala.

D) Sattvapatana, Shuddhavarta, Beejavarta

Sattvapatana

क्षाराम्लद्रावकैर्युक्तं ध्मातमाकर कोष्ठके।
यस्ततो निर्गतः सारः सत्त्वमित्यभिधीयते॥
(R.R.S. 8/34)

Minerals mixed with Kshara, Amla and Drugs of Dravaka Varga in Musha then heated strongly in Kosthi Yantra. By doing this process the Sara (Metal content) obtained is known as Satva and process is known as Satvapatana.

Shuddhavarta

यदा हुताशो दीप्तार्चिः शुक्लो स्थान समन्वितः।
शुद्धावर्तस्तदा ज्ञेयः स कालः सत्त्व निर्गमे ॥
(R.R.S. 8/56)

When the colour of flame (Agni) become bright white colour during the melting of Dravyas, then this time period is known as Suddhaavarta. It is indicative of extraction of Satva.

Beejavarta

द्राव्यद्रव्यनिभा ज्वाला दृश्यते धमने यदा।
द्रावस्योन्मुखता सेयं बीजावर्तः स उच्यते ॥
(R.R.S.8/57)

When the flame of Agni looks like the colour of the Dravya which is being melted then this period is known as Bijaavarta. It indicates the melting of the Dravya.

E) Druti: Definition, Druti Lakshana

Druti

औषधाध्मानयोगेन लोहधात्वादिकं तथा।
सन्तिष्ठते द्रवाकारं सा द्रुतिः परिकीर्तिता ॥
(R.R.S. 8/81)

Druti is the liquid state of metal or mineral which is achieved by doing process with addition of some drugs and then heating. It always remains in liquid form so known as Druti.

Druti Lakshana

निर्लेपत्वं द्रुतत्वं च तेजस्त्वं लघुता तथा।
असंयोगश्च सूतेन पञ्चधा द्रुतिलक्षणम् ॥
(R.R.S. 8/82)

Druti should have the five-characteristic included Nirlepatva, Drutatva, Tejastva, Laghuta and it does not react with Parada.

F) Parada Samskara: Definition, Importance, Ashtasamskara Parada Jaranaa, Murcchana, Names of Parada-Bandhas

Definition- In the texts of Rasa Shastra before using Parada either for Dehavada or for Loha vada there is indication of specific orderly procedures which are known as Samskars. Aacharya Charaka has explained the Samskar is following ways.

संस्कारों हि नाम गुणान्तराधानमुच्यते।
(Ch.Vi. 1/21/2)

Samskar is the process by which specific Guna can be induced or added in a Draya or individual.

The Parada which is collected from natural sources is accompanied with Doshas. So, by doing Samskaras we remove the Dosha of Parada and make it capable for Dehavada as well as Dhatuveda

Importance- Rasa Tarangini has given the following aim of Samskar.

रसायनप्रयोगेषु रसागमविशारदः।
रसराजं प्रयुञ्जीत कर्माष्टक विशाधितम् ॥
(R.T. 5/43)

For the purpose of Rasayana use the Parada that is used should be Ashta Samskarita.

In the various text of Rasa Shastra Parada Samskara is being done for the removal of Doshas as well as to potentiate the Parada. The first five Samskaras viz Svedana, Mardana, Murcchana, Utthapana and Patana are done specially to remove the Doshas of Parada. Shodhana and Samskars both process are described in Ayurveda Prakash and Rasa Tarangini. Ayurved Prakash has firstly described Samskaras and later on Shodhana is told.

अथ यदि स्वेदनादि संस्कारान् कर्तुमसमर्थः, तं प्रति सुगम रसशोधनोपायः अप्युक्ता सान्ते, ते यथा- तत्र पारद ग्रहणे तत्परीक्षामाहुः । यथा-

अन्तः सुनीलो वहिरूज्ज्वलो यो मध्याह्नसूर्यप्रतिमप्रकाशः।
योज्योऽथ धूम्रः परिपाण्डुरश्च चित्रो न योस्यो रसकर्मसिद्धये ॥ (A.P. 1/139)

Due to any reason if anyone is not capable of performing Samskaras then Parada having characteristics described above could be taken and Shodhana should be done. But before Shodhana, Svedana, Maradan and Urdhva Patana must be done.

Ashtasamskara

स्वेदो मर्दन मूर्च्छनोत्थिति ततः पातोऽपि भेदान्वितो रोधः

संयमनं प्रदीपनमिति स्पष्टाऽष्टधा संस्कृतिः । (A.P. 1/35)

स्वेदनं मर्दनञ्चैव मूर्च्छनोत्थापने तथा ।
पातनत्रितयञ्चाथ बोधनं सुनियामनम् ॥
सुप्रदीपनमित्यष्टौ प्रोक्ताः सर्वोपयोगिनः ।
संस्कारा रसराजस्य रसशास्त्रविशारदैः ॥

(R.T. 5/44-45)

The Ashta Samskaras of Parada are-

- Swedana
- Mardana
- Murcchana
- Utthapan
- Patana (Urdhwa, Adha and Tiryaka)
- Rodhana/Bodhana
- Niyamana
- Deepana

Note-

अष्टादशैव संस्काराः ऊनविंशतिकाः क्वचित् ।
सम्प्रोक्ता रसराजस्य वसुसङ्ख्या क्वचिन्मताः ॥

(A.P. 1/32)

The Parada Samskaras are eighteen, nineteen or eight type according to different opinion.

Eighteen Samskaras of Parada

स्यात्स्वेदनं तदनु मर्दन मूर्च्छने च स्यादुत्थितिः पतनरोधनियामनानि । संदीपनं गगनभक्षणमानमत्र संचारणं तदनु गर्भगता द्रुतिश्च ॥

बाह्यद्रुतिः सूतकजारणा स्याद्रागस्तथा सारणकर्म पश्चात् ।
सक्रामणं वेधविधिः शरीरयोगस्तथाऽष्टादशधाऽत्र कर्म ॥

(A.P. 1/33-34)

Swedana	Mardana
Murcchana	Utthapana
Patana	Rodhana
Niyamana	Deepana
Gagana Bhakshana Mana	Charana
Garbha Druti	Vahya Druti
Jarana	Ranjana
Sarana	Kramana
Vedha	Sharira Yoga (Bhakshana)

Nineteen Samskar

अथोनविंशतिकर्माणि यथा- स्वेदनमर्दनमूर्च्छनोत्थापनपातन बोधननियमनसन्दीपनानुवासन गगनादिग्रासप्रमाणचारणा गर्भद्रुतिबाह्यद्रुति योग जारण रञ्जन सारण क्रामण वेधन भक्षणाख्या ऊनविंशति संस्काराः सूतसिद्धिदा भवन्ति ।

(A.P. 1/36)

Swedana	Mardana
Murcchana	Utthapana
Patana	Rodhana
Niyamana	Deepana
Anuvasana	Gagana Bhakshana Mana
Charana	Garbha Druti
Vahya Druti	Jarana
Ranjana	Sarana
Kramana	Vedha
Bhakshana	

1. Svedana

क्षाराम्लैरौषधैर्वाऽपि दोलायन्त्रे स्थितस्य हि ।
पचनं स्वेदनाख्यं स्यान्मलशौथिल्यकारकम् ॥

(R.R.S. 8/59)

With the help of Kshara, Amal and herbs like Rajika. Saindhava Lavana when Parada is being subjected to Dola Yantra and Pachana is done then this is known as Svedana.

Purpose- Mala Shaithilya Karana (loosening of impurities)

Method

त्र्यूषणं लवणासुर्यौ चित्रकार्द्रकमूलकम् ।
क्षिप्त्वा सूतो मुहुः स्वेद्यः काञ्जिकेन दिनत्रयम् ॥

(R.R.S. 11/26)

आसुरिपटुकटुकत्रयचित्रार्द्रकमूलकैः कलांशैश्च ।
सूतस्य काञ्जिकेन त्रिदिनं मृदुबहिनना स्वेदयेत् ॥

(R.H.T. 2/3)

Drugs and their proportion

Ingredient	Quantity
Suta	1 part
Kalka Dravya	1/16 part
Asuri	

Saindhava Lavana	
Shunthi	
Maricha	
Pippali	
Chitraka Mula	
Ardraka	
Mulaka	
Kanjika	Q.S. for Svedana
Kadali Patra	As required for binding the bundle
Cloth piece	Sufficient to tie a bundle
Steel pot for preparing Dola Yantra	-
Glass Rod	
Gas stove or burner	

Procedure- Pottali is prepared by taking fourfold cloth, Bhurja Patra or Kadali Patra is to be placed on this fourfold cloth, then smear the leaf with prepared Kalka, on which Parada is gently placed. The remaining Kalka is put on Parada and then the Pottali is tied by a string and immersed in Dola Yantra containing Kanji then heated for three days. After three days heating, Kalka and Parada taken out from Pottali, washed with warm water carefully and Parada collected for another Samskara i.e. Mardana.

2. Mardana Samskara

उदितैरोषधैः सार्धं सर्वाम्लैः काञ्जिकैरपि ।
पेषणं मर्दनाख्यं स्याद्विहिर्मलविनाशनम् ॥
(R.R.S. 8/63)

The trituration of Parada done by said Dravyas and Kanji is known as Mardana. It removes the Vahirmala of Parada. Mardana Samskara is done in Taptva Khalva Yantra.

Purpose: Mardana eradicates the external impurities.

Method

गृहधूमेष्टिकाचूर्णं तथा दधि गुडान्वितम् ।
लवणासुरिसंयुक्तं क्षिप्त्वा सूतं विमर्दयेत् ॥
षोडशांशन्तु तद्द्रव्यं सूतमानान्नियोजयेत् ।
सूतं क्षिप्त्वा समं तेन दिनानि त्रीणि मर्दयेत् ॥
(R.R.S. 11/27-28)

गुड दग्धोर्णालवणैर्मन्दिर धूमेष्टकासुरी सहितैः ।
रसषोडशांमानैः सकाञ्जिकैर्मर्दनं त्रिदिनम् ॥
(R.H.T. 2/4)

Drugs and their proportion

Ingredient	Quantity
Parada	1 part
Kalka Dravya	1/16 part
Guda	
Dagdhorna	
Saindhava Lavana	
Griha Dhuma	
Ishtika Churna	
Asuri Churna	
Kanjika	Q.S. for grinding
Khalva Yantra made of iron preferably Tapta-khalva	-
Hot plate for keeping Khalva hot during grinding	-

Procedure- Ingredients are mixed with Parada. Kanji in required quantity is added and rubbed well for three days in a Tapta Khalva. Thereafter the mixture of Parada and Kalka Dravyas are washed with warm water or warm Kanji and is squeezed through a thick cloth and the Parada is separated.

सैन्धवं सदन धूम आसुरी यामिनी लशुनमार्द्रकं वरा ।
षोडशांशमिह निक्षिपेद्रसान्मर्दयेद्रसवरं दिनत्रयम् ॥
(र.त.)

Procedure according Rasa Tarangini- Saindhava, Grihadhooma, Mustard, Turmeric, Lashuna, Garlic and Triphala are taken in 1/16th quantity of Parada and triturated with Parada for three days. And then it is washed with hot water and Kanji.

3. Murcchana Samskara

मर्दनाऽऽदिष्टभैषज्यैर्नष्टपिष्टत्व कारकम् ।
तन्मूर्च्छनं हि वङ्गादिभूजकञ्चुकनाशनम् ॥
(R.R.S. 8/61)

Parada is made into Nashta Pishta (loses its shape and color) form with the help of said Aushadhi then it is known as Murcchana.

Purpose- It removes the Vangadi Doshas arriving from earth.

Nashta Pishta Svarupa

स्वरूपस्य विनाशेन पिष्टत्वाद्बन्धनं हि यत्।
विद्वद्भिर्निर्जितः सूतो नष्टपिष्टिः स उच्यते॥
(R.R.S. 8/63)

When Parada is Mardita with said specific drugs and its character of Chanchlya is disappeared then this condition is known as Nashta Pishta by the scholars of Rasa Shastra.

Drugs and their proportion

Ingredient	Quantity
Parada	1 part
Kalka Dravya	1/16 part
Triphala Churna	
Chitraka Mula	
Ghrita Kumari Pulp	
Khalva Yantra	-

Method

गृहकन्या मलं हन्यात् त्रिफला बह्निनाशिनी।
चित्रमूलं विषं हन्ति तस्मादेभिः प्रयत्नतः॥
मिश्रितं सूतकं द्रव्यैः सप्तवाराणि मूर्च्छयेत्।
इत्थं सम्मूर्च्छितः सूतो दोषशून्यः प्रजायते॥
(R.R.S. 11/31-32)

गृहकन्या हरति मलं, त्रिफलाऽग्नि चित्रकश्च विषम्।
तस्मादेभिमिश्रैर्वारान् संमूर्च्छयेत् सप्त॥
(Rasamrita 1/10)

Procedure- Prepare a powder of Triphala and Citraka Mula, mix these with Mardita Parada and Kumari pulp grind these forcefully till mercury disappears by getting divided into finest globules i.e. achieves Nastapistatva state. Here, days for grinding are not mentioned rather Nastapistatva state of Parada is mentioned as regards limit for grinding it may take 5-7 day's time.

कुमारिका मलं हन्ति वरा दहननाशिनी।
चित्रमूलं विषं हन्ति तस्मादेभिः प्रयत्नतः॥
मर्दितं सूतकं द्रव्यैः सप्तवाराणि मूर्च्छयेत्।
एवं सम्मूर्च्छितः सूतो दोषैः सर्वैः प्रमुच्यते॥
(र.त.)

Procedure: Kumari removes Maladosha, Triphala removes Agni Dosha and Chitraka removes Agnidosha. Hence, Parada is triturated with each of these herbs for seven times., washed with hot water and Kanji.

4. Utthapana Samskara

स्वेदातपादियोगेन स्वरूपापादनं हि यत्।
तदुत्थापनमित्युक्तं मूर्च्छाव्यापत्तिनाशनम्॥
(R.R.S. 8/62)

Doing the process with the help of Svedana process or in presence of strong sun light when Parada comes into original form then it is known as Uttapana. This Samskara removes Murccha Dosha of Parada.

Purpose- To regain the original from of Parada

Method

अस्माद्विरेकात्संशुद्धो रसः पात्यस्ततः परम्।
उद्धतः काञ्जिकक्वाथात्पूतिदोषनिवृत्तये॥
(R.R.S. 11/33)

अमुना विरेचनेन हि सुविशुद्धो नागवंग परिमुक्तः।
सूतः पातनयन्त्रे समुत्थितः कांजिक क्वाथात्॥
(R.H.T. 2/7)

Drugs and their proportion

Ingredient	Quantity
Parada	1 part
Kanji	Q.S. for washing
Patana Yantra	-

Procedure

Murcchita mercury mixture is mixed with hot water and hot Kanjika (acidic) liquid. Keep it for some time, wash it gently, remove water mixed with Kalka Dravyas and add fresh hot water or hot acidic liquid till maximum amount of mercury is regained or returns into its original form. If complete mercury is not regained by washing, dry the

remaining paste in sun rays and try to regain as much mercury as possible. In the last the remaining paste is again subjected to Patana process in Patana Yantra and heated to regain remaining portion of mercury by sublimation.

रसेन्द्रं काञ्जिकेनेह याम मात्रं विमर्दयेत्।
सलिलेः क्षालयेत् सम्यगुत्थितो जायते रसः॥
(र.त.)

Parada is triturated with Amla Kanji for three Prahara and washed with water and collected.

Patana Samskara

It is of three types viz Urdhwa Patana, Adho Patana and Tiryaka Patana.

पातनं हि महत्कर्म कथयामि सुविस्तरम्।
त्रिधापातनमित्युक्तं रसदोषविनाशनम्॥
ऊर्ध्वपातस्त्वधःपातस्त्रिर्यक्षातः क्रमेणहि॥
(र.प्र.सुः 1/47)

कृत्वातु शुल्वपिष्टिं निपात्यते नागवंगशंकातः।
तस्मिन्दोषान्मुक्त्वानिपततिशुद्धस्तथासूतः॥
(र.ह.त. 2/8)

उक्तौषधैर्मदित पारदस्य यन्त्रस्थितस्योर्ध्वमधश्च तिर्यक्॥
निर्यातनं पातन संज्ञमुक्तं वंगाहि संपर्कज कंचुकघ्नम्॥
(र.र.स.)

Definition: Subjecting Parada to Patana after processing it with the specified herbs is called as Patana Samskara.

Purpose - To get rid of Naga and Vanga Dosha.

Urdhwapatana

ताम्रेण पिष्टिकां कृत्वा पात्ये दूर्ध्वभाजने।
वङ्गनागौ परित्यज्य शुद्धो भवति सूतकः॥
शुल्वेन पातयेत्पिष्टिं त्रिधोर्ध्वं सप्तथा त्वधः॥
(R.R.S. 11/34-35)

भागास्त्रयो रसस्यार्क चूर्णस्यैकोऽथ निम्बुकैः॥
एतत्समंर्दयेत्तावद्यावदायाति पिण्डताम्।
तत्पिण्डं तल भाण्डस्थमूर्ध्वभाण्डे जलं क्षिपेत्॥
कृत्वाऽलवालं केनापि दत्वा चार्द्रं हि प्लोतकम्।
संमुद्रयाग्निमधस्तस्य चतुर्याम प्रबोधयेत्॥
युक्तोर्ध्व भाण्डसंलग्नं गृहणीयात् पारदं ततः।
ऊर्ध्वपातनमित्युक्तं भिषाग्भिः सूतशोधनं॥
ससूतभाण्डरन्ध्रे तु ह्यन्यद्विशति भाण्डकम्।
तथा सन्धिर्द्वयोः कार्यः पातनात्रय यन्त्रके॥
यन्त्र प्रमाणं वदनागुरोज्ञेयं विचक्षणैः।
रसस्य मानानियामात्कथितुं नैव शक्यते॥
(A.P. 1/68-73)

Procedure- 3 parts of Parada is mixed with 1 part Tamra and triturated with lemon juice to obtain a bolus. This is taken in Damaru Yantra and subjected to Urdhwapatana. Later, Parada is collected from the inside of the upper vessel.

Adhopatana

त्रिफलाशिग्रशिखिभिर्लवणासुरिसंयुतैः।
नष्टपिष्ट रसं कृत्वा लेपयेच्चोर्ध्वभाजने॥
ततो दीप्तैरधःपातमुत्पलैस्तत्र कारयेत्॥
(R.R.S. 11/36)

त्रिफला शिग्रुचित्रैश्च लवणासुरिका युतैः।
नष्ट पिष्टं रसं कृत्वा लेपयेदूर्ध्वभाण्डके॥
ऊर्ध्वभाण्डोदरं लिप्त्वा ह्यधोभाण्डे जलंक्षिपेत्।
संधिलेपं द्वयोः कृत्वा तद्यन्त्रं भुविपूरयेत्॥
उपरिष्टात्पुटे दत्ते जले पतति पारदः।
अधः पातन मित्युक्तं सिद्धाद्यैः सूतकर्मणि॥
(A.P. 1/75-77)

Ingredients

1. Parada	-	1 part
2. Haritaki	-	1/16 part
3. Bibhitaki	-	1/16 part
4. Amalaki	-	1/16 part
5. Asuri (Rajika)	-	1/16 part
6. Saindhava Lavana	-	1/16 part
7. Chitraka	-	1/16 part
8. Shigru Twak	-	1/16 part
9. Nimbu Rasa	-	Q.S. for Mardana

Procedure- Dravyas are taken in quantities to that of Parada triturated by adding Kanji. This Bolus is taken in Adhopatana Yantra and Patana is done. Parada is collected in the lower vessel having water. It is washed with Kanji and hot water and collected.

Tiryakpatana

तिर्यक्पातनविधिना निपातितः सूतराजस्तु ।
श्लक्ष्णीकृतमभ्रदलं रसेन्द्रयुक्तं तथाऽऽरनालेन ॥
खल्वे दत्त्वा मृदितं यावत्तन्नष्टपिष्टतामेति ।
कुर्यात्तिर्यक्पातनपातितसूतं क्रमेण दृढवह्निम् ॥
संस्वेद्यः पात्योऽसौ न पतति यावद् दृढश्चाग्नौ ।
तदाऽसौ शुद्ध्यते सूतः कर्मकारी भवेद्ध्रुवम् ॥
(R.R.S. 11/41-43)

घटे रसं विनिक्षिप्य सजलं घटमन्यकम् ।
तिर्यङ्मुखं द्वयोः कृत्वा संमुखं रोधयेत्सुधी ॥
चुल्ल्यां तथैव संस्थाप्य यत्नस्तु ततोभिषक् ।
रसाधो ज्वालयेदाग्निं यावत् सूतो जलं विशेत् ।
तिर्यक् पातनमित्युक्तं सिद्धैर्नागार्जुनादिभिः ।
मिश्रितौ चेद्रसे नागवङ्गौ विक्रम हेतुना ॥
ताभ्यां स्यात्कृत्रिमो दोषस्तुन्मुक्तिः पातनत्रयात् ॥
(A.P. 1/79-811/2)

Procedure- Parada is mixed with 1/4th part of Dhanyabhraka powder and triturated in a Khalva by adding Kanji. This mixture is subjected to Tiryak Patana in Mrudu, Madhya and Tivragni. And later, Parada is washed and collected.

Bodhana/Rodhana Samskara

मर्दनादिक योगेन जातक्लैब्यस्य शूलिनः ।
क्लैब्यापहं तु यत्कर्म बोधनं कथ्यते बुधैः ॥

Definition- Due to Mardana etc procedure, Parada losses its potency. To remove this impotency, Bodhana is done.

Purpose - To remove impotency of Parada and make it Bhubhukshu (hungry)

जलसैन्धवयुक्तस्य रसस्य दिवसत्रयम् ।
स्थितिरास्थापनी कुम्भैयाऽसौ रोधनमुच्यते ॥
(R.R.S. 8/65)

Ingredients

1. Parada	-	1 part
2. Saindhava Jala	-	Q.S.

Procedure- Parada is kept in an earthen pot containing Saindhava Jala. The mouth of pot is sealed and left for three days inside soil.

Preparation of Saindhava Jala - This is to be prepared by adding 480 g of Saindhava to 2.304 l of water.

According to Ayurveda Prakasha the process by which Parada is free from Shandatva is known as Bodhana Samskara.

एवं कदर्थितः सूतः षण्ढत्वमधिगच्छति ।
मुक्तये क्रियते तस्य बोधनं कथ्यते हितत् ॥
(A.P. 1/86)

It is done in Srishtambja with Srishtambja Artava, Mutra, Shukra and Saindhava Jala is accepted in different opinion.

Niyamana Samskara

रोधनाल्लब्धवीर्यस्य चपलत्वनिवृत्तये ।
क्रियते पारदे स्वेदः प्रोक्तं नियमनं हि तत् ॥
(R.R.S. 8/66)

After Rodhana the Virya of Parada is achieved to greater extent. To control the property of Chapaltava (hyper mobility) the process of Swedana is done which is known as Niyamana.

Method

नियम्योऽसौ ततः सम्यक् चपलत्वनिवृत्तये ।
कर्कोटीफणिनेत्राभ्यां वृश्चिकाम्बुजमार्कवैः ॥
समं कृत्वाऽऽरनालेन स्वेदयेच्च दिनत्रयम् ॥
(R.R.S. 11/46)

इति लब्धवीर्यः सम्यक् चपलोऽसौ नियम्यते तदनु ।
फणिलशुनाम्बुजमार्कवकर्कोटी चिञ्चिका स्वेदात् ॥
(R.R.T. 2/10)

Ingredients

1. Parada	-	1 part
2. Phani (Nagavalli)	-	1/16 part
3. Lasuna	-	1/16 part
4. Ambuja	-	1/16 part
5. Karkoti	-	1/16 part
6. Markava (Bhringraja)	-	1/16 part
7. Chincha	-	1/16 part
8. Kanji	-	Q.S. for Swedana

Kalka of ingredients from 2 to 7 prepared and it is mixed with Kanji in a pot. Parada is bundled

in a Pottali and Swedana is done by Dola Yantra for one day or three days.

Dipana/Samdipana

The Swedana procedure followed to make the Parada more hungry is called as Deepana.

धातुपाषाणमूलार्द्धैः संयुक्तो घटमध्यगः ।
ग्रासार्थे त्रिदिनं स्वेदो दीपनं तन्मतं बुधैः ॥
(R.R.S. 8/67)

Dipana is process in which Swedana is done for three days with the help of Dola yantra and Dravya like Tamra, Tankana, Shigru etc. By this process Parada becomes Grasarthi that is eager to eat food (Gras).

Method

भूखग टंकण मरिचैर्लवणासुरिशिग्रुकञ्जैस्त्रिदिनम् ।
स्वेदेन दीपितोऽसौ ग्रासार्थी जायते सूतः ॥
(R.H.T. 2/11)

Ingredients

1. Parada	- 1 part
2. Bhu (Sphatika)	- 1/16 part
3. Khaga (Kasisa)	- 1/16 part
4. Tankana	- 1/16 part
5. Maricha	- 1/16 part
6. Saindhava Lavana	- 1/16 part
7. Aasuri	- 1/16 part
8. Shigru	- 1/16 part
9. Kanjika	- Q.S. for Swedana

Procedure- Kalka of ingredients from 2 to 8 is prepared first and Kanji is added in a pot. Parada is bundled in a Pottali and Swedana is done Dola yantra for three days.

Anuvasna Samskara

सहस्रनिम्बूफलतोयघृष्टोरसो भवेत्बह्निसमप्रभावः ।
सव्योषराजीलवणः सबित्रः सयमठोविंशतिवासराणि ॥
(आ.प्र. 2/804)

Purpose- To make Parada as having Vahnisama- Prabhava means to improve its metal consuming power to great extent or to make it as effective and powerful as Vahni (fire).

Drugs and their proportion

1. Dipita Parada	- One part
2. Nimbuphala Toya (rasa)	1000 Nimbu fruits.
3. Tapta Khalva	- for Mardana.
4. Trikatu Churna	- 1/16th part
5. Rajika Churna	- 1/16th part
6. Saindhava Lavana	- 1/16th part
7. Chitraka Churna	- 1/16th part
8. Suddha Hingu	- 1/16th part

Procedure- Mix Asta Samskarita Parada with drugs prescribed, add thousand lemon's juice slowly and ground all in Tapta Khalva. Continue the grinding till complete juice of 1000 lemons is consumed. As per the texts grinding should be continued for 20 days, but as per our experience about 40-45 days time is needed for completing this process if Tapta Khalva is used for grinding. In the end the paste should be washed carefully with hot water and Parada may be collected and filtered.

Parada Jarana

It is thirteenth Samskar of Parada which is described by Rasa Ratna Samuchchaya as follows-

द्रुतग्रासपरीणामो विडयन्त्रादियोगतः ।
जारणेत्युच्यते तस्याः प्रकाराः सन्ति कोटिशः ॥
(R.R.S. 8/83)

Jarana is defined as the process in which liquified Gras is added to Parada is being digested with the help of Vida Dravya and Yantra. Jarana can be of many types.

Jarana according to Rasa Tarangini

सूते गन्धादिनिक्षेपात्तत्तद्विधि विशेषः ।
गन्धाद्यं जार्यते यत्तु जारणं तदिहोच्यते ॥
(R.T. 5/100)

The specific process in which Gandhaka is added to Parada and Gandhaka etc. is digested into Parada is known as Jarana.

जारणा हि नाम गालन पातन व्यतिरेकेण ग्रस्त घन हेमादि रसस्य पूर्वावस्था प्रतिपन्नत्वम् । (आ.प्र.1/107)

The process which is different from Galana and Patana, wherein the Parada digests the Swarna etc. substances, without any change in weight of Parada or its form. Here, though Parada engulfs Swarna, Rajata etc., its weight, form etc. will be same as before. Jarana Process is done by making Vida with melted Satva of Loha etc. with the help of Yantras such as Kacchapa Yantra.

Importance of Jarana

विपिनौषधिपाक सिद्धमेतद्घृततैलाद्यपि दुर्निवारवीर्यम् ।
किमयं पुनरीश्वराङ्गजन्मा घन जाम्बूनदचन्द्र भानुजीर्णः ॥
(A.P. 1/113)

When the oil and Ghrita prepared by doing Paka with different herbs have Achintya Virya i.e. their effect cannot predicted then when Parada is Jarita by using Abhraka, Svarna, Rajata and Tamra etc. its effect certainly not predicted

रसगुण बलिजारणं विनाऽयं न खलु रूजां हरणक्षमो रसेन्द्रः।
न जलद कलधौतपाकहीनः स्पृशति रसायनतामिति प्रतिज्ञा ॥
(A.P. 1/114)

While Parada is not Jarita with six times of Gandhaka to the quantity of Parada till then Parada is not capable of mitigating the disease. While till it is not Jarita with Abhraka and Svarna Parada is not capable of providing Rasayana effect.

Jarana Krama (Sequence or process of Jarana)

Rasa Chintamani has described the following Jarana sequence.

गन्धकं जारयेत्पूर्व यन्त्रे कच्छप संज्ञके ।
पश्चाद्वै जारयेद् व्योम हेम प्रभृति यद्भवेत ॥
पश्चान्नागादयः सर्वे जार्यन्ते रत्नसंकराः ।
क्रमोऽयं विद्यते सर्वजारणासु न संशयः ॥
बिना गन्धेन ये मर्त्याः कुरूते धातुजारणाः ।
न सुधा जायते सूते जरयन्ति न धातवः ॥
तस्माद्गन्धः पुरा जार्यः सूतवह्निविवृद्धये ॥
(Rasa.Chin. 5/70-72)

First Gandhaka should be Jarita with the help of Kacchapa Yantra. After it Abhraka, Svarna Makshika Satva, and then Svarna and Naga followed by Ratna Jarana.

This is Jarana sequence. Without Gandhaka Jarana Parada is not able to digest the Gras. So, to increase the Agni (Digestive power) of Parada first Gandhaka Jarana should be done.

Types of Jarana

ग्रासस्य चारणं गर्भे द्रावणं जारणं तथा ।
इति त्रिरूपा निर्दिष्टा जारणा वरवार्तिकैः ॥
ग्रासः पिण्डः परिणामस्तित्स्त्रश्चाख्याः पराः पुनः ।
समुखा निर्मुखा चेति जारणा द्विविधा पुनः ॥
(R.R.S. 8/69-71)

Addition of Gras to Parada followed by liquification (Dravikarana) of Gras and mixing it with Parada completely these three stages are told by Rasacharyas. These are known as Gras, Pinda and Parinam respectively.

Gras Charna → Garbha Dravana → Jarana
↓ ↓ ↓
Gras Pinda Parinama

Jarana is also of two types i.e. Samukha and Nirmukha.

एतैर्विमार्दितः सूतश्छिन्नपक्ष, प्रजायते ।
मुखं च जायते तस्य धातुश्च ग्रसतेतराम् ॥
(A.P. 1/176)

Deepana Samskar is also known as Mukhakarana.

वस्तुतस्तु दीपनयैवापर पर्यायो मुखकरणमिति न पृथक संस्कारः । (A.P. 1/180)

Jarana Type

- Samukha Jarana
- Nirmukha Jarana
- Vasana Mukha Jarana
- Bhuchari Jarana
- Khechari Jarana (with help of Ratna (Gems)
- Bala Jarana
- Vriddha Jarana
- Bala Jarana (Parada is done Jarana with equal quantity of Abhraka)

- Yuva Jarana (Parada is done Jarana with four times quantity of Abhraka)
- Vriddha Jarana (Parada is done Jarana with six times quantity of Abhraka)

Note- Gandhaka Jarana is of two types i.e. Bahirdhoom and Antardhoom and in the context of this Jarana and Murcchana are synonym to each other.

Result of Jarana

Depending upon amount of Gandhaka taken for Jarana Parada provides different effect.

तुल्ये तु गन्धके जीर्णे शुद्धाच्छतगुणो रसः।
द्विगुणे गन्धके जीर्णे सर्वथा सर्वकुष्ठहा॥
त्रिगुणे गन्धके जीर्णे सर्वजाड्यविनाशनः।
चतुर्गुणे तथा जीर्णे वलिपलितनाशनः॥
गन्धे पञ्चगुणे जीर्णे क्षयक्षयकरो रसः।
षडगुणे गन्धके जीर्णे सर्वरोगहरो रसः॥
अवश्यमित्युवाचेदं देवीं श्री भैरवः स्वयम्।
(A.P. 1/118-120)

This can be summarised as follows:

Quantity to Parada	Result
Equal to Parada	100 times more effective than Shuddha Parada
Two times	Sarva Kushtha Nashaka
Three times	Sarva Jadya Nashaka
Four times	Bali and Palita Nashaka
Five times	Rajyakshma Nashaka
Six times	Sarvarogahara

Murcchana

तत्तद्विधिप्रभेदेन रसस्याव्यभिचारतः।
व्याधिघातकता या स्यात् सा मता मूर्च्छना बुधैः॥
(R.T. 6/1)

By using different method and different Rasa Dravyas so that Parada is accomplished with quality to kill the disease definitely this process is known as Murcchana.

The Murcchana is having importance in preparing different Rasa Aushadhis. It is different to Murcchana Samskara of Parada as later is useful to remove the Vangadi Bhujkanchuka Doshas.

Characteristic of Murcchita Parada

कज्जलाभो यदा सूतो विहाय घनचापलम्।
मूर्च्छितस्तु तदा ज्ञेयो नानावर्णोऽपि च क्वचित्॥
(A.P. 1/385)

Murcchita Parada has following characters :

1. It is black in colour
2. It is devoid of Ghana (Solid) and Chapaltava
3. It may of different colour besides to that of black colour.

Note- Acharya Madhava has said that Murcchana and Jarana are synonyms to each other in the context of Gandhaka Jarana but there is following difference.

पूर्वावस्थाप्रतिपन्नात्वं जारण तथा मूर्च्छनायन्तु न पूर्वावस्थाप्रतिपन्नतेति। (Com. on. R.T. 6/1)

In Jarana the original stage of Parada is Pratipanna (Achieved) while it is not available in Murcchita Parada.

Types of Murcchana

निर्गन्धा च सगन्धा च मूर्च्छना द्विविधा मता।
निर्गन्धा गन्धरहिता सगन्धा गन्धसंयुता॥
निर्गन्धा रसपुष्पदौ मूर्च्छना परिकीर्तिता।
सगन्धा तु विशेषेण रससिन्दूरकादिषु॥
(R.T. 6/2-3)

Murcchana is of two types-

1. Nirgandha (Without addition of Gandhaka)
2. Sagandha (With addition of Gandhaka)

Rasa Pushpa is example of Nirgandha Murcchana and Rasa Sindoor is example of Sagandha Murcchana.

Sagandha Murcchana can be of three types :

1. Bahirdhuma - For example Rasa sindoor
2. Antardhuma - Rasa Sindoor
3. Nirdhuma (Without fumes) - e.g. Kajjali

Definition of Bahir and Antar Dhuma

जीर्णगन्धे तु यत्कूपीवक्त्ररोधनपूर्वकम्।
पाचनं मूर्च्छना सा तु बहिर्धूमाभिधा मता॥
(R.T. 6/6)

When the mouth of Kupi is closed after

Gandhaka Jaran then this type is known as Bahir Dhooma. Simply in Bahir Dhooma fumes or Dhooma goes out from Kupi.

निरूह्यारम्भतः कूपी मुखं यद्गन्धजारणम्।
मूर्च्छना सा भिषग्वर्यैरन्तर्धूमाभिधा मता॥
(R.T. 6/5)

When Gandhaka Jarana is done by corking the mouth of Kupi from beginning then this method is known an Antardhooma method.

Ayurveda Prakash has described five types of Murcchana

यथा त्रिविधाऽपि केवलं गन्धपिष्टिगन्धबद्धगन्धजीर्ण रसगन्ध कज्जली धातु पिष्टिभेदेन पञ्चधा। धातु पिष्टिश्च कनक रजत शुल्व घनसत्त्व कालायस प्रभेदैः पञ्चधा॥
(A.P. 1/137)

Five types of Murcchana

1. Gandha Pishti
2. Gandha Baddha - Rasa Parpati
3. Gandha Jirna - Purna Chandrodaya
4. Rasa Gandhaka - Kajjali
5. Dhatu Pishti - Svarna, Rajat, Tamra, Abhraka Satva and Kala Loha.

Two types of Murcchana

1. Sagandha (With Gandhaka)
2. Nirgandha (Without Gandhaka)

Four types of Murcchana

1. **Saagni (By application of Heat)**- Rasa Parpati, Rasa Sindoora, Makardwaja, Sameer Pannaga, Mall Sindoora
2. **Niraagni- Kajjali**
3. **Saagni (Without application of Heat)**- Rasa Puspa, Rasa Karpoor
4. **Niraagni**- Mugdha Rasa

Three types of Mucchana

1. Bahir Dhooma
2. Antar Dhooma
3. Nirdhooma

Murcchana

Gandha	Gandha Baddha	Gandha jirna	Rasa Gand-haka	Dhatu Pishti
Pishti	Rasa Parpati	Rasa Sindoora	Kajjali	Svarna Pishti Rajat pishti Tamra pishti Abhraka satva pishti Kal Loha Pishti

Types of Rasa Murchhita Aushadhi

Parpati	Kupipakwa	Kharliya	Pottali
Rasapa-rparti	Rasa Sindoora	Tribhuv-ankirti, Kajjali etc.	Rasa Garbha, Hema Garbha Pottali etc.

Difference between Murcchan and Murcchana

Murcchan	Murcchana
It is 3rd Samskara of Parada	It is a process by which Parada mitigates the disease definitely
Parada is Nashta Pishta after Chapalatva	Parada is devoid of Ghana and the process and colour is black
It is only one type	It is of many types

Names of Parada Bandhas

पञ्चविंशतिसङ्ख्याकान् रसबन्धान् प्रचक्ष्महे।
येन येन हि चाञ्चल्यं दुर्ग्रहत्वं च नश्यति॥
रसराजस्य सम्प्रोक्तो बन्धनार्थो हि वार्तिकैः॥
(R.R.S. 11/59-60)

The various processes by which Chanchalya (Quick movement) and Durgrahitva (Difficulty in handling) is restricted are known as Bandha or Bandhana. Rasa Bandnas are of twenty-five types.

According to Rasaranta Samucchaya

येन येन हि चाञ्चल्यं दुर्ग्रहत्वं च नश्यति।
रसराजस्य सप्रोक्तो बन्धनार्थो हि वार्त्तिकैः॥
(र.र.स.11/60)

The procedures that are capable of relieving hypermobility and difficult to grab qualities of Parada are called as Bandhas.

Types of Bandha

The Parada Bandhas are twenty-five or twenty six types (R.R.S.), Rasarnava-five types. Anand Kanda five types and Ayurveda Prakash four types.

पाटः खोटो जलौका च भस्म चापि चतुर्थकम् ।
बन्धश्चतुर्विधो ज्ञेयः सूतस्य भिषगुत्तमैः ॥
(A.P. 1/363)

The four types of Parada Bandhas are Pota, Khota, Jaluka and Bhasma. Rasa Ratna Samuchchaya has explained twenty-five or twenty-six types of Bandhas. The detail is as follows.

हठारोटौ तथाऽऽभासः क्रियाहीनश्च पिष्टिका ।
क्षारः खोटश्च पोटश्च कल्कबन्धश्च कज्जलिः ॥
सजीवश्चैव निर्जीवो निर्बीजश्च सबीजकः ।
शृङ्खलाद्रुतिबन्धौ च बालकश्च कुमारकः ॥
तरुणश्च तथा वृद्धो मूर्तिबद्धस्तथाऽपरः ।
जलबन्धोऽग्निबन्धश्च सुसंस्कृतकृताभिधः ।
महाबन्धाभिधश्चेति पञ्चविंशतिरीरिताः ॥
(R.R.S. 11/61-63)

1. Hatha
2. Aarota
3. Aabhasa
4. Kriyahina
5. Pishtika
6. Kshara
7. Khota
8. Pota
9. Kalka
10. Kajjali
11. Sajiva
12. Nirjiva
13. Sabeeja
14. Nirbeeja
15. Shrinkhaka
16. Druti
17. Balaka
18. Kumar
19. Taruna
20. Vriddha
21. Murtibaddhe
22. Jalabandha
23. Agnibandha
24. Susanskrita
25. Mahabandha

The twenty sixth Bandha is Jaluka Bandha which is used in Stri Dravana.

केचिद्वदन्ति षड्विंशो जलूकाबन्धसंज्ञकः ।
स तावन्नेष्यते देहे स्त्रीणां द्रावेऽतिशस्यते ॥
(R.R.S. 11/64)

Here is the summary of all Bandha-

Hatha Bandha

हठोरसः स विज्ञेयः सम्यक् शुद्धि विवर्जितः ।
स सेवितो नृणां कुर्यान्मृत्युं वा व्याधिमुद्धतम् ॥
(र.र.स.11/65)

Bandha done without proper purification of Parada is called as Hata Bandha. By consuming this, death occurs.

Effect/use- Vyadhikara (disease) and Mrutyukara (death)

Arota Bandha

सुशोधितो रसः सम्यगारोट इति कथ्यते ।
स क्षेत्रीकरणे श्रेष्ठः शनैर्व्याधि विनाशनः ॥
(र.र.स.11/66)

Bandha done after proper Shodhana of Parada is called as Arota Bandha. This is considered for the purpose of Kshetreekarana.

Effect/use- Disease can be relieved gradually.

Abhasa Bandha

पुटितो यो रसो याति योगमुक्त्वा स्वभावताम् ।
भावितो धतुमूलाद्यैराभासो गुणवैकृतेः ॥
(र.र.स.11/67)

Bandha done by giving Bhavana and Putapaka with Dhatus and herbs is called as Abhasa Bandha

Effect/use- Guna Vaikrita

Kriyaheena Bandha

असंशोधितलोहाद्यैः साधितो यो रसोत्तमः ।
क्रियाहीनः स विज्ञेयो विक्रियां यात्य पथ्यतः ॥
(र.र.स.11/68)

Bandha of purified Parada with unpurified Lohas is called as Kriyaheena Bandha.

Effect/use- After consuming this, if Apathya is followed, then it leads to health complications

Pishtika Bandha

तीव्रातपे गाढतरावमर्दात्पिष्टी भवेत्सा नवनीतरूपा ।
ख्यातः स सूतः किल पिष्टि बद्धः संदीपनः पाचन कृद्विशेषात् ॥
(र.र.स.11/69)

Parada is triturated under intense sunlight till it gains the paste form.

Effect/use- It acts as Deepana and Pachana.

Kshara Bandha

शङ्ख शुक्ति वराटाद्यैर्योऽसौ संसाधितो रसः ।
क्षारबन्धः परम् दीप्तिपुष्टिकृच्छूलनाशनः ॥
(र.र.स.11/70)

Bandha done with Bhasmas of Shankha, Kaparda etc is called as Kshara Bandha.

Effect/use-It acts as Deepana, and Shula Nashaka (relieves abdominal colic).

Khota Bandha

बन्धो यः खोटतां याति ध्मातो ध्मातः क्षयं व्रजेत् ।
खोट बन्धः स विज्ञेयः शीघ्रं सर्व गदापहः ॥
(र.र.स.11/71)

Bandha done by which Parada attains a spherical shape and does not lose its shape woven alter subjecting it to high temperature is called as Khota Bandha.

Effect/use-It relieves all diseases. (शीघ्रं सर्व गदापह)

Pota Bandha (Rasa Parpati)

दृतकज्जलिका मोचपात्रके चिपतिक्रता ।
स पोटः पर्पटी सैव बालाध्याखिलरोगनुत् ॥
(र.र.स.11/72)

Kajjali is prepared with purified Parada and Gandhaka, melted and posed between two banana leaves to get a flan cake. This is called as Pota Bandha.

Effect/use- It relieves all diseases.

Kalka Bandha

स्वेदाद्यैः साधितः सूतः पङ्कत्वं समुपागतः।
कल्कबद्धः स विज्ञेयः योगोक्तफलदयकः ॥
(र.र.स.11/73)

Due to Swedana etc procedures when Parada gains wet mud like consistency, it is called as Kalka Bandha.

Effect/use- It improves the quality of medicinal compounds and it is also used individually.

Kajjali Bandha

कज्जली रसगन्धोत्था सुश्लक्ष्ण कज्जलोपमा ।
तत्तत् योगेन संयुक्त कज्जली बन्ध उच्यते ॥
(र.र.स.11/74)

Purified Parada and Gandhaka are triturated to obtain a fine soft powder called Kajjali.

Effect/use- It improves the quality of medicinal compounds and it is also used individually.

Sajeeva Bandha

भस्मीकृतो गच्छति वह्नियोगाद् सूतः सजीवः खलु संप्रदिष्टः ।
संसेवितोऽसौ न करोति भस्मकार्यं जराव्याधिविनाशनञ्च ॥
(र.र.स.11/75)

Parada Bhasma, which gets evaporated upon subjecting it to fire, is called as Sajeeva Bandha.

Effect/use- Jara Vyadhi Nashaka

Nirjeeva Bandha

जीर्णाभ्रको वा परिजीर्णगन्धो भस्मीकृतश्चाखिललौहमौलिः।
निर्जीवनाम ही स भस्म सूतो निःशेष रोगान्विनिहन्ति सद्यः ॥
(र.र.स.11/76)

Parada Bhasma, which has been done Jarana with Abhraka or Gandhaka is called as Nirjeeva Bandha.

Effect/use- Roga Nashaka

Nirbeeja Bandha

रसस्तु पादांश सुवर्ण जीर्णः पिष्टीकृतो गन्धकयोगतश्च ।
तुल्यांश गन्धैः पुटितः क्रमेण निर्बीज नाम सकलामयघ्नः ॥
(र.र.स.11/77)

Purified Parada is done Jarana with 1/4th quantity of Swarna. It is done Pisti with equal part of Gandhaka. This Pishti is placed in equal quantity of Gandhaka, packed inside a Samputa and subjected to mild, medium and intense heat. This is called as Nirbeeja Bandha.

Effect/use-Cures all diseases

Sabeeja Bandha

पिष्टि कृतैरभ्रकसत्वहेमतारार्ककान्तैः परिजारितो यः ।
हतस्ततः षड्गुणगन्धकेन स बीजबद्धो विपुल प्रभावः ॥
(र.र.स.11/78)

Abhraka Satwa, Swarna, Rajata, Tamra, Kanta Loha - all these are done Jarana with Parada and a Pshiti is prepared. It is triturated with Gandhaka and Putapaka is done. The Bhasma obtained is called as Nirbeeja Bandha.

Effect/use- It is highly effective.

Shrunkhala Bandha

वज्रादिनिहतः सूतो हतः सूतः समोऽपरः ।
श्रृंखलाबद्धसूतस्तु देहलोहविधायकः ॥
चित्र प्रभावं वेगेन व्यप्ति जानाति शंकरः ॥
(र.र.स.11/79)

Parada which is done Marana with Ratnas and another Parada which is done Marana with Gandhaka and herbs are taken together and mixed. This is called as Shrukhala Bandha.

Effect/use- It relieves old age and makes the body strong and brings about amazing benefits

Druti Bandha

युक्तोऽपि बह्यदृतिभिश्च सूतो बन्धंगतो वा भसितस्वरूपः ।
स राजिकापादमितो निहन्ति दुःसाध्यरोगान्दृतिबद्धनाम ॥
(र.र.स.11/80)

Bhasma prepared with Parada, which has been done Bahya Fruit is called as Druti Bandha.

Effect/use- It is consumed in 1/4th Rajita quantity to relieve difficult-to-treat-diseases.

Balaka Bandha

समाभ्रजीर्णः शिवजस्तु बालः संसेवितो योगयुतो जबेन् ।
रसायनो भाविगदापहश्च सोपद्रवारीष्ट गदानिहन्ति ॥
(र.र.स.11/81)

Parada is done Jarana with equal quantity of Abhraka.

Effect/use- By consuming this, the difficult-to-treat-diseases can be treated.

Kumara Bandha

हरोद्भवो यो द्विगुणाभ्रजीर्णः स स्यात्कुमारो मिततण्डुलोऽसौ।
त्रिःसप्तरात्रैः खलु पापरोगसंघातघाती च रसायनं च ॥
(र.र.स.11/82)

Bhasma prepared with Parada which has been done Jarana with Hingula and Abhraka is called as Kumara Bandha.

Effect/use- It cures all diseases and also acts as Rasayana.

Taruna Bandha

चतुर्गुणव्योमकृताशनोऽसौ रसायनाग्र्यस्तरूणाभिधानः ।
अ सप्तरात्रात्सकलामयघ्नो रसायनो वीर्यबलप्रदाता ।
(र.र.स.11/83)

Bhasma of Parada, which has been done Jarana with 4 times of Abhraka is called as Taruna Bandha.

Effect/use- It cures all diseases, improves strength and acts as Rasayana.

Vruddha Bandha

यस्याभ्रकः षड्गुणितो हि जीर्णः प्राप्ताग्निसख्यः स हि वृद्धनामा । देहे च लोहे च नियोजनीय शिवादृते कोऽस्य गुणान्प्रवक्ति ॥ (र.र.स.11/84)

Bhasma of Parada, which has been done Jarana with 6 times of Abhraka is called as Taruna Bandha.

Effect/use- It is useful both in Dehavada and Lohavada.

Moorti Bandha

यो दिव्यमूलिकाभिश्च कृतोऽत्यग्निसहो रसः ।
विनाभ्रजारणात्स स्यान्मूर्तिबन्धि महारसः ॥
अयं हि जार्यमाणस्तु नाग्निना क्षीयते रसः ।
योजितः सर्वयोगेषु निरौपम्यफलप्रदः ॥
(र.र.स.11/85-86)

Parada Marana done with Divine herbs is called as Moorti bandha.

Use/effect- It does not get lost even alter putting on fire and can cure all diseases.

Jala Bandha

शिलातोयमुखैस्तोयैर्बद्धोऽसौ जलाबन्धवान् ।
स जरारोगमृत्युघ्नः कल्पोक्तफलदायकः ॥
(र.र.स.11/87)

Parada Bandha done with Shila Toya (water which has continuous contact with stones, minerals etc) is called as Jala Bandha.

Use/effect- Jara and Mrityu Nashaka

Agni Bandha

केवलो योगयुक्तो वा ध्मातः स्याद्वुटिकाकृतिः ।
अक्षीणश्चाग्निबद्धोऽसौ खेचरत्वादिकृत् स हि ॥
(र.र.स.11/88)

When Parada is blowed into fire and if it gets converted into tablet form, such a Bandha is called as Agni Bandha.

Effect/use- One can walk in space, by holding this tablet in mouth (Khecharatva).

Susamskruta Bandha

विष्णुक्रान्ताशशिलताकुम्भिकनकमूलकैः ।
विशालानागिनीकन्दव्याघ्रपादिकुरण्टकैः ॥
वृश्चिकालीभशुण्डीयां हंसपादी सहासुरैः ।
अप्रसूतगवां मूत्रैः पिष्टं बालुकके पचेत् ॥
पक्कमेवं मृतैर्लोहैर्मर्दितं विपचेद्रसम् ।
यन्त्रेषु मूर्च्छा सूतानामेष कल्पः सुसंकृतः ॥

(र.र.स.11/89-91)

Vishnukranta, Somalata, Jalakumbhi, Dhatturamoola, Indrayana, Lakshmana kanda, vikankata twak, Vishala, nagini kanda, Vyaghra padi, Kurantaka, Vrushcikali, Shundika Hamsapadi Mudgaparni, Rajita - all these are triturated with urine of the cow, which has not become pregnant even once, and a bolus is prepared. This bolus is triturated with Parada and subjected to fire in Valuka Yantra. Tus obtained Bhasma is mixed with Dhatu Bhasmas, kept in Sharava Samputa and Puta is given. It is called as Susamskruta Bandha

Effect/use- Rasayana

Maha Bandha

हेम्ना व रजतेन वा सहचरो ध्मतो व्रजत्येकताम्
अक्षीणो निबिडो गुरूश्च गुटीकाकारश्च दीर्घोज्ज्वलः ।
चूर्णत्वं पटुवत्प्रयाति निहतो घृष्टो न मुञ्चेन्मलम्
निर्गन्धो द्रवति क्षणात्स हि महाबन्धाभिधानो रसः ॥

(र.र.स.11/93)

Parada Bandha, which, upon subjecting to intense heat along with Swarna or Rajata, does not lose weight, remains in solid form, and retains spherical shape, has long lasting lustre, is not brittle, does not get stained upon rubbing, easily melts upon heating and devoid of any smell, such a Bandha is called as Maha bandha.

Effect/use- Rasayana

Pramanikarana Paribhasha (Terms for Standardization)

Grahy-Agrahyattva

Grahya Lakshana- The Characters of the Dravya, which are desired so that it is taken for the preparation of medicine. These are known as Grahya Lakshanas. The characters whose presence is not desired for its acceptance is known as Agrahyata. For example, Grahya and Agrahya, Lakshana of Parada is as follows-

अन्तः सुनीलो बहिरुज्जवलो यो
मध्याह्नसूर्यप्रतिमप्रकाशः । योज्योऽथ..... ॥

(A.P. 1/139)

The Parada which is Antah Sunila (Bluish from inside), Bahirujjwalah (Whitish from outside), Madhyahana Surya Pratim Prakash (When pure shines like mid-day sun) is selected for use in various process. These are the physical qualities of pure Parada.

Agrahya Parada

धूम्रःपरिपाण्डुरश्च चित्रो न योज्यो रसकर्म सिद्धयै ॥

(A.P. 1/139)

The Parada which looks Dhumra (Smoky) Pari Pandura (Complete yellowish) and Chitra (Having shades of various colour) should not be taken for Rasa Karma.

Siddhilakshana - Siddhi Lakshana are indicative of completion of process which is being done for the preparation of particular dosage form. For example, Avaleha Siddhi Lakshana are indicative of that Avaleha Paka process is completed.

Bhasma pariksha - Varitara, Rekhapurnata, Unama, Slakshnattva, Sukshma, Anjana Sannibha, Dantagrena Kachakacha Bhavati, Varna, Avami, Apunarbhava, Niruttha, Gata Rasattva, Nischandrattva, Niramlattva, Nirdhumattva, Jihvagre adahyamanattva, Dadhi/ Nimbu Pariksha.

Bhasmapariksha- After the process of Marana is over the resultant obtained is subjected to set of examinations called as Bhasma Pariksha, after

passing all these test a Bhasma is said to be qualified and fit for internal use.

The Bhasma particles should be of minimum size for easy absorption and assimilation in the body. Hence, the determination of fitness, softness and irreversible from of Bhasma, some tests are to be given by our ancient scholars of Rasashastra.

These Parameters can be divided into two groups :

- **Physical tests-** Varitara, Rekhapurnata, Unama, Shlakshnatvam, Sushma, Anjana Sannibha, Dantagre Na Kach kacha Bhavati, Varna, Avami,
- **Chemical parameters-** Apunarbhava, Niruttha, Gata Rasatvam, Nishchandratvam, Nirdhumatva.

सुपक्वे तन्तुमत्त्वं स्यादवलेहोऽप्सु मज्जति।
स्थिरत्वं पीडिते मुद्रागन्धवर्णरसोद्भवः॥

In the Rasa Shastra various quality control parameters are given for the examination of Bhasmas. There are known as Bhasma Pariksha. The various parameters for Bhasma Pariksha are as follows-

Varitara

मृतं तरति यत्तोये लोहं वारितरं हि तत्॥
(R.R.S. 8/26)

Metal prepared to Bhasma should float on water surface is known as Varitara. This condition is achieved due to fineness and lightness of Bhasma.

Rekhapurnata

अङ्गुष्ठतर्जनीस्पृष्टं यत्तद्रेखान्तरे विशेत्।
मृतलोहं तदुद्दिष्टं रेखापूर्णाभिधानतः॥
(R.R.S. 8/27)

When prepared Bhasma is enters into the fine lines of fingers while rubbed in between index and thumb finger then that Mrita Loha is known as Rekhapurna.

Unama

हंसवत्तीर्यते वारिण्युत्तमं परिकीर्तितम्॥
(R.R.S. 8/29)

When a little amount of Apunarva Bhasma is sprinkled over water and then Dhanya is placed over it. Dhanya floats over it like Hansa [Swan] then the prepared Bhasma is having Unam property.

Slakshnattva-A little amount of Bhasma taken and rub in between the index finger and thumb, if it does not produce any irritation it is called Shlakshnatvam.

Sukshma and Anjana Sannibha- Sukshma is very fine and Anjana Sannibha, i.e. very fine having uniform consistency property is indicative of Sukshma property and Lochananjana Sannibha. These parameters are specially examined for Abhraka Bhasma.

Dantagre Na Kachakache Bhavati

Rasa, Uparasa, Loka etc. Bhasma should not produce Kachakacha sound when it is pressed between both tooth and it should resemble to Ketaki Rajas.

Varna

स्वर्ण चम्पक वर्णाभं कृष्णत्वं तारताम्रयोः।
कांस्यं धूसरवर्ण स्यान्नागः पारावतप्रभः॥
वङ्ग शुभ्रत्वमायाति तीक्ष्णं जम्बूक फलोपमम्।
अभ्रकं चेष्टिकाभं स्याद्धातूनां वर्णनिर्णयः॥
(Y.R.)

1. Svarna - Champaka Varna
2. Rajata and Tamra - Black
3. Kamsya - Dhusara Varna
4. Naga - Paravat Varna
5. Vanga - White
6. Tikshna Lauha - Jambu Varna
7. Abharaka - Ishtika Varna

Avami-After intake of Bhasma it should not induce vomiting sensation. It is applicable to all Bhasma.

Apunarbhava

गुडगुञ्जासुखस्पर्शमध्वाज्यैः सह योजितम्।
नायाति प्रकृतिं ध्मानादपुनर्भवमुच्यते॥
(R.R.S. 8/28)

Apunarbhava is the condition of Bhasma from which it cannot be reverted to its metallic form even if mixed with Guda, Gunja, Tankana, Honey and Ghrita i.e. Mitrapanchaka and heated to the temperature at which the Bhasma is prepared.

Niruttha

रौप्येण सह संयुक्तं ध्मातं रौप्येण चेल्लगेत् ।
तदा निरुत्थमित्युक्तं लोहं तदपुनर्भवम् ॥
(R.R.S. 8/30)

Niruttha is the condition of Bhasma in which it is subjected to Puta, at which Bhasma is prepared, with silver. After puta process the weight of silver is identical (Same) to its weight taken initially.

Gata Rasattva-The prepared Bhama should not have any taste and it should be devoid of any Rasa.

Nishchandratva - Bhasma when it is examined in light of sun rays it should not have any shining particles or lusture.

Niramalatva - It is special test for Tamra and Kasisa Bhasma. Both of these Bhasmas should not have Amalatva.

Nirdhumattva - When Bhasma of Hartala is subjected to fire then if there is no Dhumra (smoke) it is indicative of completely prepared Bhasma.

Jihvagreadahyamanattva- When Bhasma is kept over tongue or tongue tip it should not have any taste instead of there is the feeling of Adhyaman.

Dadhi/Nimbu Pariksha- Tamra Bhasma is kept into curd if it turns blue colour then Bhasma is not prepared and if curd is remained unchanged the Bhasma is prepared properly.

Puraka Paribhasha (Supplementary)
Rudra Bhaga, Dhanvantari Bhaga

Rudra Bhaga

भैषज्य क्रीणित द्रव्य भागोऽप्येकादशो हि यः ।
वणिभ्यो गृह्यते वैद्ये रूद्रभागः स उच्यते ॥
(R.R.S. 8/3)

When medicine is purchased from trader then as a commission one by eleventh part of price is being given to Vaidya then this in known as Rudra Bhaga.

Dhanvantari Bhaga

अर्धं सिद्धरसस्य तैलघृतयोर्लेहस्य भागोऽष्टमः संसिद्धाखिललोहचूर्णवटकादीनां तथा सप्तमः ।
यो दीयेत भिषग्वराय गदिभिर्निदिश्य धन्वन्तरिं सर्वाऽऽरोग्यसुखाप्तये निगदितो भागः स धन्वन्तरेः॥
(R.R.S. 8/82)

The specific amount of prepared medicine of different category given to physician in the name of Lord Dhanvantari by the patient for obtaining total health and happiness is known as Dhanvantari Bhag. The specific amount of various category drug is as follows according Rasatarigini.

Category of medicine	Amount given to Physician
Rasa Aushadhi	1/2 part
Ghruta and Taila	1/2 part
Avaleha	1/8 part
All dhatu Bhasma	1/7 part
Churna and Vati	1/7 part
Asava and Arishta	1/4 part

7) Mana-Paribhasha

A) Definition

मीयतेऽनेनेति मानम् (Amarkosha)

By whom any this is measured is known as Maana.

The process by which anything is measured in terms of weight, volume or length it is known as measurement. It is expressed in certain specific units. In the ancient period Ratti, Pala etc. for the expression of weight, Bindu, Shukti etc. for volume of liquid, and Vitasti, Hasta etc. were used for the measurement of length. In modern time the various systems like M.K.S. or C.G.S. or F.P.S. are used being M.K.S. the most common. Here length in meter, weight in kilogram and time in second is expressed.

Classical Types

Mana is of three types :

पाय्यं हस्तादिभिर्मानं द्रुवय कुड़वादिभिः।
पौतवं तुलया तस्य सूत्र स्याद्भाग सूत्रकम्॥
(Vaijanti Kosha : Samanya kanda)

1. Payaya Maana- measured by Hasta used for length measurement.
2. Druvaya Maana- generally used to measure liquid and Kudava Patra is used.
3. Pantava Maana- measured by using weighing balance normally used to measure weight.

The Pautava Maana is again of two types-

मानं च द्विविधं प्राहुः कालिङ्ग मागधं तथा।
कालिङ्गान्मागधं श्रेष्ठमेवं मानविदो विदुः॥
(Cha.Kalp. 12/105)

Maana is of two types-

1. Magadha Maana- Superior (It was used in the region of Magadha at present Bihar state)
2. Kalinga Maana- Used in the region of Kalinga (Today's Orissa state)

Maana described by Acharya Charaka (Magadha/Pautava Maana)

षड् ध्वंश्यस्तु मरीचिः स्यात षण्मरीच्यस्तु सर्षपः।
अष्टौ ते सर्षपा रक्तास्तण्डुलश्चापि तद्द्वयम्॥
धान्यमाषो भवेदेको धान्यमाषद्वयं यवः।
अण्डिका ते तु चत्वारस्ताश्चतस्त्रस्तु माषकः॥
हेमश्च धान्यकश्चोक्तो भवेच्छाणस्तु ते त्रयः।
शाणौ द्वौ द्रङ्क्षण विद्यात् कोल बदरमेव च॥
विद्याद् द्वौ द्रङ्क्षणौ कर्ष सुवर्ण चाक्षमेव च।
विडालपदकं चैव पिचुं पाणितलं तथा॥
तिन्दुक च विजानीयात् कवलग्रहमेव च।
द्वे सुवर्णे पलार्धं स्याच्छुक्तिरष्टमिका तथा॥
द्वे पलार्धे पलं मुष्टिः प्रकुञ्चोऽथ चतुर्थिका।
बिल्वं षोडशिका चाम्रं द्वे पले प्रसृतं विदुः॥
अष्टमानं तु विज्ञेयं कुडवौ द्वौ तु मानिका।
पलं चतुर्गुण विद्यादञ्जलिं कुडवं तथा॥
चत्वारः कुडवाः प्रस्थश्चतुः प्रस्थमथाढकम्।
पात्रं तदेव विज्ञेयं कंसः प्रस्थाष्टकं तथा॥
कंसश्चतुर्गुणो द्रोणश्चार्मणं नल्वणं च तत्।
स एव कलशः ख्यातो घटमुन्मानमेव च॥
द्रोणस्तु द्विगुणः शूर्पो विज्ञेयः कुम्भ एव च।
गोणी शूर्पद्वयं विद्यात् खारी भारं तथैव च॥
द्वात्रिंशतं विजानीयात वाहं शूर्पणि बुद्धिमान्।
तुला पलशतं विद्यात् परिमाण विशारदः॥
शुष्क द्रव्येष्विदं मानमेवमादि प्रकीर्तितम्।
(Cha.Kalp. 12/87-97)

Specific measurements

- 6 Dhvamsi - 1 Marichi (1- Dhavamsi- Trasarenuka- other Acaharya consider Dhavamsi is the smallest dust particle)
- 6 Marichi -1 Rakta sarshapa
- 8 Rakta sarshapa- 1 Tandula
- 2 Tandula- 1 Dhanyamasha
- 2 Dhanyamasha- 1 Yava
- 4 Yava- 1 Andika (6 Guda- 1 Mashaka- Jatukarna)
- 4 Andika - 1 Mashaka (Hema & Dhanyaka) (10 Ratti- 1 Mashaka according to Sushruta 5 Rattti- 1 Mashaka)
- 3 Mashaka - 1 Shaana (48 Mashaka- 1 Pala, 12 Mashaka- 1 Karsha)
- 2 Shaana -1 Drankshana (Kola, Badara)
- 2 Drankshana -1 Karsha (Suvarna, Aksha, Bidaalapadaka, Picu, Panitala, Tinduka or Kavalagraha)
- 2 Suvarna - 1 Palaardha (Sukti, Astamika)
- 2 Palardha -1 Pala (Mushti, Prakuncha, Caturthika, Bilva, Shodashika, Amra)
- 2 Pala - 1 Prasruta (Ashtamaan)
- 4 Pala - 1 Anjali (Kudava)
- 2 Kudava - 1 Manika
- 4 Kudava - 1 Prastha
- 4 Prastha -1 Aadaka (Patra)
- 8 Prastha -1 Kansa
- 4 Kansa -1 Drona (Armana, Nlvana, Kalasha, Ghata, Unmaan)
- 2 Drona -1 Surpa (Kumbha)
- 2 Surpa -1 Goni (Khaari, Bhara)
- 32 Surpa -1 Vaha
- 100 Pala - 1 Tula. [87-97]

This is Maana for weighing dry drugs.

Maana according to Shrangdhara

जालान्तरगते भानौ यत्सूक्ष्मं दृश्यते रजः ॥
तस्य त्रिंशत्तमो भागः परमाणुः स कथ्यते ।
जालान्तरगतैः सूर्यकरैर्वंशी विलोक्यते ॥
षडवंशीभिर्मरीचिः स्यात्ताभिः षड्भिस्तु राजिका ।
तिसृभी राजिकाभिश्च सर्षपः प्रोच्यते बुधै ॥
यवऽष्टसर्षपैः प्रोक्तो गुञ्जा स्यात्तच्चतुष्टयम् ।
षड्भिस्तु रक्तिकाभिः स्यान्माषको हेमधान्यकौ ॥
माषैश्चतुर्भिः शाण स्याद्धरणः स निगद्यते ।
टङ्कः स एव कथितस्तद्वयं कोल उच्यते ॥
क्षुद्रको वटकश्चैव द्रंक्षणः स निगद्यते ।
कोलं द्वयं च कर्षः स्यात्स प्रोक्तः पाणिमानिका ॥
अक्षं पिचुः पाणितल किंचित्पाणिश्च तिन्दुकम् ।
विडालपदकं चैव तथा षोडशिका मता ॥
कर मध्यो हंसपदं सुवर्ण कवलग्रहः ।
उदुम्बरं च पर्यायैः कर्ष एव निगद्यते ॥
स्यात्कर्षाभ्यामर्धपलं शुक्तिरष्टमिका तथा ।
शुक्तिभ्यां च पलं ज्ञेयं मुष्टिराम्रं चतुर्थिका ॥
प्रकुञ्चः षोडशी बिल्वं पलमेवात्र कीर्त्यते ।
पलाभ्यां प्रसृतिर्ज्ञेया प्रसृतश्च निगद्यते ॥
प्रसृतिभ्यामञ्जलिः स्यात्कुडवोऽर्ध शरावकः ।
अष्टमानं च स ज्ञेयः कुडवाभ्यां च मानिका ॥
शरावोऽष्टपलं तद्वज्ज्ञेयमत्र विचक्षणैः ।
शरावाभ्यां भवेत्प्रस्थश्चतुःप्रस्थैस्तथाढकम् ॥
भाजनं कंसपात्रं च चतुःषष्टिपल च तत् ।
चतुर्भिराढकैर्द्रोणः कलशो नल्वणोर्मणः ॥
उन्मानश्च घटो राशिर्द्रोण पर्याय संज्ञका ।
द्रोणाभ्यां शूर्पकुम्भौ च चतुःषष्टिशरावकाः ॥
शूर्पाभ्यां च भवेत् द्रोणी वाही गोणी च सा स्मृता ।
द्रोणी चतुष्टयं खारी कथिता सूक्ष्मबुद्धिभिः ॥
चतुःसहस्त्रपलिका षण्णवत्यधिका च सा ।
पलानां द्विसहस्त्रं च भार एकः प्रकीर्तितः ॥
तुला पल शतं ज्ञेया सर्वत्रैवैष निश्चयः ।

(Sha. Pra. 1/16-31)

Definition of Paramanu- The dust particle seen in the sunlight coming from window its 1/30th part is known as Paramanu. Aacharya Sharangadhara has started his Maana from this Paramanu.

30 Paramanu	=	1 Vanshi
6 Vanshi	=	1 Marichi
6 Marichi	=	1 Rajika
3 Rajika	=	1 Sarshapa
8 Sarshapa	=	1 Yava
4 Yava	=	1 Gunja
6 Gunja	=	1 Marshaka (also known as Hema dhanyaka)
4 Mashaka	=	1 Shana (Dharana, Tanka)
2 Shana	=	1 Kola (Kshudraka, Vataka, Drankshana)
2 Kola	=	1Karsha (Paanimanika, Aksha, Pitchu, Pannitala, Panitinduka, Vidalpadaka, Shodashika, Karmadhya, Hamspada, Suvarna, Kavalgrah, Udumbar
2 Karsha	=	1 Ardha Pala (Shukti, Ashtamika)
2 Shukti	=	1 Pala (Musthi, Aamra, Chaturthika, Prakuncha, Shodas Bilwa)
2 Pala	=	1 Prasriti (Prasrita)
2 Prasrata	=	1 Anjali (Kudava, Ardhasharava, Ashtamana)
2 Kudava	=	1 Maanika (Sharava, Ashtapala)
2 Sharava	=	1 Prastha
4 Prastha	=	1 Aadhaka (Bhajana, Kamsapatra, Chatuh shashilipala)
4 Aadhaka	=	1 Drona (Kalasha, Nalvana, Armana, Unimana, Ghata Rashi)
2 Drona	=	1 Sharpa (Kumbha, Chatuhshashti Sharava)
2 Shrupa	=	1 Droni (Vaahi, Goni)
4 Droni	=	1 Khari (4096 Pala)
200 Pala	=	1 Bhaara
100 Pala	=	1 Tula

Chaturguna Sutra

माषटङ्काक्षबिल्वानि कुडवः प्रस्थमाढकम् ।
राशिर्गोणी खारिकेति यथोत्तर चतुर्गुणा ॥

(Sha. Pra. 1/32)

Masha, Tanka, Aksha, Bilwa, Kudava, Prastha, Aadhaka, Raashi, Gorni and Khari becomes 4 times to their suceeding one on moving from Masha to Khari. It is

4 Masha	=	1 Tanka
4 Tanka	=	1 Aksha
4 Aksha	=	1 Bilwa
4 Bilwa	=	1 Kudava
4 Kudava	=	1 Prastha
4 Prastha	=	1 Aadhaka
4 Aadhaka	=	1 Raashi
4 Raashi	=	1 Goni
4 Goni	=	1 Khari

Maana according to Aacharya Sushruta

पलकुडवादीनामतो **मानं तु व्याख्यास्यामः- तत्र द्वादश धान्यमाषा मध्यमाः सुवर्णमाषकः, ते षोडश सुवर्णम्; अथवा मध्यम निष्पावा** एकोनविंशतिर्धरणं, तान्यर्धतृतीयानि **कर्षः, ततश्चोर्ध्वं** चतुर्गुणमभिवर्धयन्तः **पल कुडव प्रस्थाढक द्रोणा** इत्यभिनिष्पद्ययन्ते, **तुला पुनः पल शतं,** तापुनर्विंशतिर्भारः **शुष्काणामिदं मानम् । आर्द्र द्रवाणां च द्विगुणामिति ।**

(Su.Chi. 31/7)

12 Dhanya Masha of medium size = 1 Suvarna Maashaka

(मध्यमा मध्यम प्रमाणाः तेन नातिस्थूला नातितनवश्च ग्राह्याः- Dalhana)

- 16 Suvarna Maashaka = 1 Suvarna Karsha
- 19 Nishpava of medium size = 1 Dharana
- 11/2 Dharana = 1 Karsha

After it Pala, Kudava, Prastha, Aadhaka, Drona moving from Pala to Drona these becomes 4 times to succeeding one.

- 100 Pala = 1 Tula
- 20 Tula = 1 Bhaara

This is the Maana for dry drugs. For Aardra Dravya and Drava (liquid) it is 2 times to it.

Kalinga Maana as per Aacharya Shrangdhara

यवो द्वादशभिर्गौरसर्षपैः प्रोच्यते बुधैः ॥
यवद्वयेन गुञ्जा स्यात्रिगुञ्जो वल्ल उच्यते ।
माषोगुञ्जाभिष्टामिः सप्तभिर्वा भवेत् क्वचित् ॥
स्याच्चतुर्माषकैः शाणः स निष्कण्टङ्क एव च ।
गद्याणो माषकैः षड्भिः कर्षः स्याद्दशमाषिकः ॥
चतुष्कर्षैः पलं प्रोक्तं दशशाणमितं बुधैः ।
चतुष्पलैश्च कुडवं प्रस्थाद्याः पूर्ववन्मताः ॥

(Sha.Pra. 1/39-42)

12 Gaura Sarshapa	=	1 Yava
2 Yava	=	1 Gunja
3 Gunja	=	1 Valla
8 Gunja	=	1 Maasha
4 Maasha	=	1 Shana (Nishka, Tanka)
6 Maasha	=	1 Gadyana
10 Maasha	=	1 Karsha
4 Karsha	=	1 Pala
4 Pala	=	1 Kudava

The rest Maana are same to that of Maagadha Maana.

Kudava Patra

मृद्वक्षवेणुलोहादेर्भाण्डं यच्चतुरङ्गुलम् ।
विस्तीर्णं च तथोच्चं च तन्मानं कुडवं वदेत् ॥

(Sha. Pra. 1/35)

अङ्गुलशब्देनात्राङ्गुष्ठनखतल भागं गृह्णन्ति ।

(Adhamalla)

The vessel made of either one soil, bamboo, metals like gold etc. having its Aayama, Parimaana and height of 4 Angula then its capacity is standardized as 1 Kudava.

Druvaya Maana

The measurement of liquid thing is known as Druvaya Maana. Its units are Bindu, Shaana, Shukti etc.

Bindu

प्रदेशिन्यङ्गुली पर्वद्वयान्मग्नसमुद्धृतात् ।
यावत्पतत्यसौ बिन्दुर्दशाष्टौ षट् क्रमेण ते ॥

(Ash. Hri.Sut. 20/9)

Pradeshni Aanguli (Index finger) when it is dipped by it's two Parva then taken out from the liquid the amount of liquid which fell in first time this amount is Bindu.

बिन्दुभिश्चाष्टभिः शाणः प्रोक्तश्चैव भिषक्तमैः ।
द्वात्रिंशबिन्दुभिश्चात्र शुक्तिश्चैव निगद्यते ॥
द्वे शुक्ति पाणि शुक्तिश्च नस्यकर्मणि पूजिता ।
(Todarananda)

8 Bindu = 1 Shaana

32 Bindu = 1 Shukti

64 Bindu = 1 Paani Shukti

According to Aacharya Sushruta

तस्य प्रमाणमष्टौ बिन्दवः प्रदेशिनीपर्वद्वयनिःसृताः प्रथमा मात्रा, द्वितीया शुक्तिः, तृतीया पाणिशुक्तिः ।
(Su.Chi. 40/28)

अङ्गुष्ठ समीपवर्तिन्यङ्गुलिः प्रदेशिनी, तत्पर्वद्वयच्युता बिन्दवः । प्रथमा मात्रा हीनेत्यर्थः । मध्यम मात्रा शुक्तिर्द्वात्रिंशद्बिन्दवः । उत्तमा पाणिशुक्तिश्चतुःषष्टिबिन्दवः ।
(Dalhana)

Bindu- The amount that comes out after dipping the first too pore of index finger in known as Bindu.

32 Bindu = 1 Shukti

64 Bindu = 1 Paanishukti

Paayya Maana

The measurement of length is known as Paaya Maana. In Rasa Shastra the topic of Puta includes various units that are used to measure the length. It includes various units that are used to measure the length. These are Vyama, Rajhasta, Aratni, Vitasti, Angula. These are used to measure the length, width and depth or height.

Angula-अष्टौ यव मध्या अङ्गुलम् (Kautilya)

8 Yava when tied in its middle together the length formed is equal to one Angula.

Vyama- व्यामो नाम विस्तारित बाहुयुगस्य पुंसः दक्षिणहस्तमध्यमाङ्गुल्यग्रभागाद् वाम हस्त मध्यमाङ्गुल्यग्रभाग पर्यन्त दीर्घता । (R.T. Com.3/41)

The length, from Kurpara to Kanishithika while little finger is free and the rest are as Mushti, is known as Aratani.

Vitasti- द्वादशाङ्गुला

1 Vitasti = 12 Angula

1 Aratni = 22 Angula

1 Hasta = 24 Angula

In modern time meter decimetre, centimetre, millimetre, decametre, hectometre and kilometre217 are used to measure the length.

B) Classical and Modern- Conversion chart as per AFI, Scientific Metrology

Maana described in Ayurvedic Formulary of India with its contemporary modern equivalent.

Weight and Measures

Classical Unit		Metric Equivalent
1 Ratti/Gunja		125 mg.
8 Ratti	= 1 Masha	1 g.
12 Masha	= 1 Karsha (Tola)	12 g.
2 Karsha	= 1 Shukti	24 g.
2 Shukti	= 1 Pala	48 g.
2 Pala	= 1 Prasrita	96 g.
2 Prasrata	= 1 Kudava	192 g.
2 Kudava	= 1 Mannika	384 g.
2 Mannika	= 1 Prastha	768 g.
4 Prastha	= 1 Aadhaka	3 kg. 73 g.
4 Aadhaka	= 1 Drona	12 kg. 228 g.
2 Drona	= 1 Shurpa	24 kg. 576 g.
2 Shurpa	= 1 Droni (Vaha)	49 kg. 152 g.
4 Droni	= 1 Khaari	196 kg. 608 g.
100 Pala	= 1 Tula	4 kg. 800 g.
20 Tula	= 1 Bhaara	96 kg.

[In the case of liquids, the metric equivalents would be the corresponding litre and millilitre]

Linear Measurements

Classical Unit	Inches	Metric Equivalents
Yavodara	1/8 or 3/10 inch	0.24 cm
Angula	3/4 inch	1.25 cm
Vitasti	9 inch	22.86 cm

Aratni	101/2 inch	41.91 cm
Hasta	18 inch	45.72 cm
Rajahasta	22 inch	55.88 cm
Vyama	72 inch	182.88 cm

C) Essential Kala- Mana

Measurements of Time

Unit		Equivalent as per modern
2 Kshana	= 1 Lava	-
2 Lava	= 1 Nimesha	-
3 Nimesha	= 1 Kashtha	= 4.66 sec.
1 Ghari		= 24 min.
30 Kashtha	= 1 Kala	= 2 min. and 20 sec.
20 Kala+3 Kashtha	= 1 Muhurta	= 48 min.
30 Muhurta	= 1 Ahoratra	= 24 hours
15 Ahoratra	= 1 Paksha	= 15 days
2 Paksha	= 1 Maasa	= 30 days
2 Maasa	= 1 Riu	= 60 days
3 Ritu	= 1 Ayana	= 6 month
2 Ayana	= 1 Samvatsara	= 12 month or 1 year
5 Samvatsara	= 1 Yuga	= 5 years
1 Ahoratra (Daiva)		= 1 year
1 Ahoratra (Pitra)		= 1 month

Maana according to Modern Scientific Metrology

Imperial System of Weight

1 Grain	=	0.0648 gm.
1 Drachm	=	1.771845 gm.
1 Ounce	=	28.34952 gm.
1 Pound	=	453.592 gm.
1 Stone	=	6350.2932 gm.
1 Quarter	=	12.700 kg.
1 Hundred weight	=	50.802 kg.
1 Ton	=	1016.0469 kg.

Metric system of weight

10 miligrams	=	1 centigram
10 centigrams	=	1 decigram
10 decigrams	=	1 gram
10 grams	=	1 decagram
10 decagrams	=	1 hectogram = 100 grams
10 hectograms	=	1 kilogram = 1 kg.
1000 kg.	=	1 metric ton

Metric system of liquid weight

1 deciliter	=	1/10 liter
1 centiliter	=	1/100 liter
1 mililiter	=	1/1000 liter
1 decaliter	=	10 liter
1 hectoliter	=	100 liter
1 kiloliter	=	1000 liter

Metric system of length

1 meter	=	39.37 inch
1 decimeter	=	1/10 meter
1 centimeter	=	1/100 meter
1 milimeter	=	1/1000 meter
1 decameter	=	10 meter
1 hectometer	=	100 meter
1 kilometer	=	1000 meter

3 CHAPT. Adharbhuta Siddhanta (Application of fundamental principles)

Syllabus

- **Dravya Sangrha and Samrakshana**
- Time of drug Collection
- General Rules
- Specific time for specific plant part collection
- Time of the day for drug collection
- Collection of Pranija Dravya
- Place of Drug collection Bhumi Mahabhuta predominance
- Places from where drugs should not be collected
- Stage of drug collection
- Rule of Duplication (Dwiguna Mana Ganana)
- Ardra and Shushka Dravya mana
- Dravya Sangraha Vidhi and Dravya Samrakshana
- Rasa, Guna, Virya, Vipaka, Prabhava
- **Anukta Visheshokta Grahana:** Considering Anukta Dravya
- **Aushadha Namakarana:** Naming a Preparation
- **Aushadha Sevana Kala:** Time of Drug Administration
- **Saveeryata Avadhi** (Shelf life of different Kalpana)
- **Aushadha Matra:** Dosage / Posology
- **Anupana & Sahapana (Adjuvant)**
- **Yougika Dravya Siddhanta (Drug Combination)**

Learning objectives

- Elaborate fundamental principles of Ayurvediya Aushadhi Nirmana along with their classical references and discuss their application with classical examples of various Kalpas.
- Explain Dravya Samgraha vidhi. Explain types of Bhumi Desha and types of drugs to be collected from particular place & places from where Dravya should not be collected.
- Describe time of Dravya collection and explain rationality behind it.
- Enlist parts of Sthavara & Jangama Dravyas used for Ayurvediya Aushadhi Nirmana.
- Define Samskara. Discuss role of Samskara in Ayurvediya Aushadhi Nirmana along with various examples.
- Describe Ardra - Shushka Dravya & Anukta – Visheshokta Dravya collection principles.
- Describe importance of Kalpa Sevan Matra. Explain factors considered for deciding dosage of any drug (Ayurvedic as well as modern medicine principles). Describe Posology
- Explain Saveeryata Avadhi(Shelf life) of Ayurvedic dosage forms.

- Discuss Yogika Dravya Sidhdhanta (Drug combination)
- Explain importance of Kala (Time) Samskara in Ayurvediya Aushadhi Nirmana. Elaborate Aushadhi Sevana kala mentioned in Sharangadhara Samhita. Describe chrono- Therapeutics
- Justify Aushadhi Kalpa Namakarana Siddhanta with examples

Total - 6 hours (Lecture :04 hour, Non-lecture: 02 hours)

Marks- 5 marks, LAQ (10 Marks)- No, SAQ (5 Marks)- Yes, MCQ- Yes

Dravya Sangraha and Samrakshana

Time of drug Collection- General Rules

शरद्यखिलकार्यार्थं ग्राह्यं सरसमौषधम्।
विरेकवमनार्थञ्च वसन्तान्ते समाहरेत्॥
(Sha. Pra. Kha. 1/59)

According to Acharya Sharangadhara in Sharada Ritu plant having its Rasa and all other properties should be collected which should be used for all purposes while drugs used for Vaman and Virechana Karma should be collected at the end of Vasant Ritu.

Specific time for specific plant part collection

तत्र यानि कालजातान्युपागतसंपूर्णप्रमाण-रसवीर्य-गन्धानि कालातपाग्निसलिलपवनजन्तुभिर-नुपहत-गन्ध-वर्ण-रसस्पर्श-प्रभावाणि प्रत्यग्राण्यु-दीच्यां दिशि स्थितानि; तेषां शाखापलाशमचिरप्ररूढं वर्षावसन्तयोर्ग्राह्यं, ग्रीष्मे मूलानि शिशिरे वा शीर्णप्ररूढपर्णानां, शरदि त्वक्कन्दक्षीराणि, हेमन्ते साराणि, यथर्तु पुष्पफलमीति; मङ्गलाचारः कल्याणवृत्तः शुचिः शुक्लवासाः संपूज्य देवता अश्विनौ गोब्राह्मणांश्च कृतोपवासः प्राङ्मुख उदङ्मुखो वा गृह्णीयात्॥ (Cha.Kalp. 1/10)

कन्दं हिमर्तौ, शिशिरे च मूलं, पुष्पं वसन्ते, फलदं वदन्ति।
प्रवाल-पत्राणि निदाघकाले स्युः पञ्च जातानि शरत्प्रयोगे॥
(Raj. Nighantu 2)

- Drugs should be collected in the suitable season when they have attained maturity in respect to their Upagata Sampurna (endowed with high quality) like Pramana (proper size), Rasa (taste), Virya (potency) and Gandha (smell). Drugs having Gandha (smell), Varna (color), Rasa (taste), Sparsha (touch) and Prabhava (specific action) should have remain unaffected by Kala (time), Atapa (sun), Agni (fire), Salila (water), Pavana (air) and Jantu (organisms or parasites). Drug should be fresh, endowed with all properties and drug should be collected preferably from northern direction.
- Fresh branches and tender leaves should be collected in Varsha Rutu (rainy season), Vasanta Rutu (spring season) and Grahya (fully mature).
- Mula (roots) should be collected in Grishma (summer season) and Shishira Rutu (late winter) when the leaves of the trees have ripened and withered out.
- Twaka (bark), Kanda (tubers) and Kshira (latex) should be collected in Sharad Rutu (autumn season).
- Sara (heartwood) should be collected in Hemanta Rutu (early winter)
- Pushpa (flowers) and Phala (fruits) collected according to their season.

Collection part of plant according to different season

S. No.	Part of plant	Season as per Charaka	Season as per Raj Nighantu
1.	Shaka,	Varsha and Vasanta Rutu	-
2.	Palasha/Patra	Varsha and Vasanta Rutu	Grishma Rutu
3.	Mula	Grishma and Shishira Rutu	Shishira Rutu
4.	Twka	Sharad Rutu	-
5.	Kanda	Sharad Rutu	Hemanta Rutu
6.	Kshira	Sharad Rutu	-
7.	Sara	Hemanta Rutu	-
8.	Pushpa	According to season	Vasanta Rutu
9.	Phala	According to season	-
10.		Panchanga	- Shishira Rutu

Time of the day for drug collection- It should be collected in morning (Pratah Kala).

Collection of Pranija Dravya

जङ्गमानां वयःस्थानां रक्तरोमनखादिकम्।
क्षीर मूत्र पुरीषाणि जीर्णाहारेषु सहरेत्॥
(Su.Sutra. 37/17)

Rakta, Roma and Nakha should be collected from Jangama animals Milk, urine and stool should be collected after digestion of food.

Place of Drug collection

Bhumi Mahabhuta predominance

"तत्र देशे साधारणे जाङ्गले वा यथाकालं शिशिरातपपवन सलिल सेवते समे शुचौ प्रदक्षिणोदके श्मशान-चैत्य-देवयजनागार-सथा-श्वभ्राराम-वल्मीकोषरविरहिते कुशरोहिषास्तीर्णे स्निग्ध कृष्ण मधुर मृत्तिके सुवर्ण वर्ण मधुरमृतिके वा मृदावफाल कृष्टेऽनुपहतेऽन्यैर्बलवत्तरैर्द्रुमैरौषधानि जातानि प्रशस्यन्ते।" (Cha.Kalp. 1/9)

धन्वे साधारणे देशे समे सन्मृत्तिके शुचौ।
श्मशान चैत्यायतनश्वभ्रवल्मीकवर्जिते॥
मृदौ प्रदक्षिण जले कुश रोहिष संस्तृते।
अफालकृष्टेऽनाक्रान्ते पादपैर्बलवत्तरैः॥
शस्यते भेषजं जातं युक्तं वर्णरसादिभिः।
जन्त्वदग्धं दवादग्धमविदग्धं च वैकृतैः॥
भूतैश्छायातपाम्ब्वाधैर्यं थाकालं च सेवितम्।
अवगाढमहामूलमुदीचीं दिशमाश्रितम्॥
(Ash.Hri.Kalp 6)

Drug are used for therapeutic effects should be collected from the place having following characteristics features-

1. Grown in Sadharana (normal) and Jangala Desha (marshy land) are to be collected.
2. Plants should have been exposed to Shishira (seasonal cold), Atapa (sun- heat), Pavana (air) and Salila (water). यथाकालमिति यथाकालं शिशिरादिभिः सेविते देशे- plants grown according to the proper season and place.
3. Plants should be grown in clean land, with facilities of sufficient water, except Shmashana (cremation ground), Chaitya (sacred place), Devayajanagara (temple), Sabha (जनमेलकस्थानम्-meeting place), Shvabhrarama Valmikosha Virahita (ditch, parks, ant-hills and barren land).
4. Covered with Kusha and Rohisha plants, having Snigdha (unctuous), Krushna (black), Madhura Murtika (sweet soil), Suvarna Varna Madhura Mrutika (golden colour sweet soil), Mrudu (soft) and there should not be other big trees in the vicinity over shadowing the plants.

Places from where drugs should not be collected

It should not be collected from crematorium, Chaitya, Devayajanagar, Sabha (Assembly ground), pit, ant hills and saline soil.

Acharya Sushruta has described five types of land according to Panchabhautika combination.

विशेषतस्तु तत्र, अश्मवती, स्थिरा, गुर्वी श्यामा, कृष्णा वा स्थूलवृक्षशस्य प्राया स्नगुणभूयिष्ठा, स्निग्धा शीतलऽऽसन्नोदका स्निग्धशस्य तृणकोमल वृक्ष प्राया शुक्लाम्बु गुण भूयिष्ठा; नाना वर्णा लध्वश्मवति प्रविरलाल्पपाण्डु वृक्षप्ररोहाऽग्निगुण भूयिष्ठा; रूक्षा भस्मशसभवर्णा तनु वृक्षाल्परसकोटरवृक्षप्रायाऽनिलगुण भूयिष्ठा; नाना वर्णा लध्वश्मवति प्रविरलाल्पपाण्डु वृक्षप्ररोहाऽग्निगुण भूयिष्ठा; रूक्षा भस्मशसभवर्णा तनु वृक्षाल्परसकोटरवृक्षप्रायाऽनिलगुण भूयिष्ठा; मृद्वी सभा श्रभ्रवत्याव्यक्तरसजला सर्वतोऽसार वृक्षा महापर्वत वृक्ष प्राया श्यामा चाकाशगुण भूयिष्ठा॥ (Su. Sutra. 36/4)

1. Parthiva– Pathrili, Kathina, Guru, having Shyam Varna.
2. Jaliyua– Shweta Varuna, Snigdha, Sheetala, having Mridu dhanya.
3. Aagneya– Pandu varna, having stone of various colour small trees.
4. Vayava– Ruksha, having colour of Bhasma/ Dhusara and Alpa Rasa tree.
5. Akasha– Mridu, pit and having Shyam Varna soil.

Stage of drug collection

Dhanya (grains)

अनार्तवं व्याधिहतमपर्यागतमेव च।
अभूमिजं नवञ्चापि न धान्यं गुणवत् स्मृतम्॥
(Su. Sutra. 46/50)

The Dhanya which is grow in other season from its normal season, decayed by any disease, in polluted land and fresh one should not be taken.

Phala (Fruit)

व्याधितं कृमिजुष्टं च पाकातीतमकालजम्।
वर्जनीयं फलं सर्वमपर्यागतमेव च॥
(Su. Sutra. 46/210)

The fruit which is decayed by disease, eaten by insects, after long time from its ripening period and not coming from its original season should not be taken.

फलेषु परिपक्वं यद् गुणवत्तदुदाहृतम्।
बिल्वादन्यत्र विज्ञेयमामं तद्धि गुणोत्तरम॥
(Su. Su. 46/209)

All the fruits are beneficial in its ripen state except Bilwa. Bilwa is beneficial while it is unripened.

Shaka (Vegetables)

कर्कशं परिजीर्ण च कृमिजुष्टमदेशजम्।
वर्जयेत् पत्रशाकं तद् यदकाल विरोहि च॥
(Su.Su. 46/298)

Shaka which is Karkasha, Parijirna (Totally old) eaten by insects, grown in polluted land and in different season should not be accepted.

Kanda (root)

बालं ह्यनार्तवं जीर्णं व्याधितं कृमिभक्षितम्।
कन्दं विवर्जयेत् सर्वं यो वा सम्यङ्ग न रोहति॥
(Su. Su. 46/313)

Bala (Not fully grown), grown in different season, destroyed by insects and which is not capable to reproduce should not be taken. From Kanda Vidarikanda, Shatavari, Surankanda etc. should be accepted.

Rule of Duplication (Dwiguna Mana Ganana) and Ardra and Shushka Dravyamana

The Maana Paribhasha given in Ayurvedic texts is followed for dry drugs that are told in various formulations. Aardra (Fresh) and Drava (Liquid) Dravya should be taken two times written in the Yogas. However, there are various concepts regarding it which is as follows–

शुष्क द्रव्येष्विदं मानमेवादि प्रकीर्तितम्।
द्विगुणं तत् द्रवेष्विष्ट तथा सद्योद्धृतेषु च॥
(Cha.Ka. 12/98)

The Maan is described for dry drugs. Drava and Aardra Dravya should be taken in twice quantity written in formulations.

यद्धिमानं तुला प्रोक्ता पलं वा तत् प्रयोजयेत्।

If the Maana is told in Tula or Pala then Drava and Aardra should be taken as it is.

According to Acharya Sharangadhara

गुञ्जादिमानमारभ्य यावत्स्यात्कुडवस्थितिः।
द्रवार्द्र शुष्क द्रव्याणां तावन्मानं समं मतम्॥
(Sha.Pra. 1/33)

Drava, Aardra and dry drugs if these are expressed in terms of Gunja to Kudava then these should be taken as it is.

प्रस्थादिमानमारभ्य द्विगुणं तद्द्रवार्द्रयोः।
मानं तथा तुलायाश्च द्विगुणं न क्वचित्स्मृतम्॥
(Sha.Pra. 1/34)

From Prastha to Tula Maana– Double quantity should be taken. From Tula to onwards-should not be taken is double quantity. On this verse Adhmalla has commented that dry drugs are Guru and Tikshna so these are taken in half quantity to that of Aardra Dravya.

शुष्क द्रव्यस्य या मात्रा त्वार्द्रस्य द्विगुणा हिसा।
शुष्कस्य गुरुतीक्ष्णात्वात्तस्मादर्धं प्रयोजयेत्॥

The same is also described by Bhaishajya Ratnavali.

Exception to Dwiguna Rule

Here are some drugs that should not be taken in double amount although these are used fresh always.

गुडुची कुटजो वासा कूष्माण्डं च शतावरी।
अश्वगन्धा सहचरी शतपुष्पा प्रसारिणी॥
प्रयोक्तव्या सदैवार्द्रा द्विगुणा नैव योजयेत्।
(Sha.Pra. 1/45)

That is Guduchi, Kutaja, Vasa, Kushmanda,

Shatavari, Ashwagandha, Sahachara, Shatpuspha, Prasarini these should always use in fresh condition without Dwiguna.

According to Bhaishjya Ratnavali

वासानिम्बपटोलकेतकि बलाकूष्माण्डकेन्दीवरी
वर्षाबूकुटजाश्वगन्धसहितास्ताः पूतिगन्धामृताः ।
मांसं नागबला सहाचरपुरौ हिंग्वार्द्रके नित्यशः
ग्राह्यास्तत्क्षणमेव न द्विगुणिता ये चेक्षुजाता गणाः ॥
(B.R. Paribhasha 4)

Vasa, Nimba, Patola, Ketaki, Bala, Kushmanda, Indivara, Punarnava, Kutaja, Ashwangandha, Prasarini, Guduchi, Mamsa, Nagbala, Sahchara, Guggulu, Hingu, Aardraka, Ikshu Gana and Ikshu Vikar should always be used in fresh condition without taking double quantity.

Dravya Sangraha Vidhi

तत्र यानि कालजातान्युपागतसंपूर्णप्रमाण-रसवीर्य-गन्धानि कालातपाग्निसलिलपवनजन्तुभिर-नुपहत-गन्ध-वर्ण-रसस्पर्श-प्रभावाणि प्रत्यग्राण्यु-दीच्यां दिशि स्थितानि; तेषां शाखापलाशमचिरप्ररूढं वर्षावसन्तयोर्ग्राह्यं, ग्रीष्मे मूलानि शिशिरे वा शीर्णप्ररूढपर्णानां, शरदि त्वक्कन्दक्षीराणि, हेमन्ते साराणि, यथर्तु पुष्पफलमीति; मङ्गुलाचारः कल्याणवृत्तः शुचिः शुक्लवासाः संपूज्य देवता अश्विनौ गोब्राह्मणांश्च कृतोपवासः प्राङ्मुख उदङ्मुखो वा गृह्णीयात् ॥ (Cha.Ka. 1/10)

The above description given by Aacharya Charaka can be divided into two parts.

1. Quality of Medicinal plant
2. Collection of specific plant part according to season.

Medicinal plant should be collected in appropriate season while it has fully grown having its desired Rasa, Virya, Gandha, should not damage by heat, fire, water, air and animals. These should be endowed with all qualities and should be collected from the northern side. These should be collected while facing towards the east or north after doing auspicious rites in a spirit of compassion, living a pure life, wearing white dress and offering prayers to God Aswini, Gau (Cows) and Brahamins and observing fast.

WHO Guidelines for Collection of Medicinal Plants

As per WHO guidelines these are described under good collection practices for medicinal plants. Before collection it is important to take permission to collect (in some countries), technical planning and selection of medicinal plants for collection. Collection practices should ensure the long-term survival of wild population and their associated habitats. Medicinal plant materials should be collected during the appropriate season or time period to ensure the best possible quality of both source materials and finished products. It is well known that the quantitative concentration of biologically active constituents varies with the stage of plant growth and development. The best time for collection should be determined according to the quality and quantity of biologically active constituents rather than the total vegetative yield of the targeted medicinal plant parts. Medicinal plants should not be collected in or near where high levels of pesticides or other possible contaminants are used or found such as road side, drainage ditches, mine tailings, garbage dumps and industrial facilities which may produce toxic emissions. In the course of collection efforts should be made to remove parts of plant that are not required and foreign matter, in particular toxic weeds. Decomposed medicinal plant materials should be discarded. In general, the collected raw material plant material should not come into direct contact with soil. If underground part such as roots are used, any adhering soil should be removed from the plants as soon as they are collected. Collecting implements, such as machetes, shears, saws and mechanical tools should be kept clean and maintained in proper condition. Then parts that come into direct contact with the collected medicinal plant should be free from excess oil and other contamination.

Dravya Samrakshana

Herbal drugs used in the Ayurveda have short life span and every drug is not available everywhere due to their different habitat. So, it is very much

necessary that after proper collection these should be stored and preserve well so that their quality should remain intact and these can be used for making formulations. Acharya Charaka has given the following method for storage of drug.

गृहीत्वा चानुरूपगुणवद्भजनस्थान्यगारेषु प्रागुदग्द्वारेषु निवातप्रवातैक देशेषु नित्यपुष्पोपहारबलिकर्मवत्सु, अग्नि सलिलोपस्वेदधूमरजोमूषकचतुष्पदामनभिगमनीयानि स्ववच्छन्नानि शिक्येष्वासज्य स्थापयेत्। (Cha. Ka. 1/11)

After collection of drug should be kept in suitable good containers well covered with lid and stored in rooms facing preferably eastward or northward, devoid of wind but well ventilated (with exhaust fans in a portion) and daily ritualized with offering of flower and other things, holding them up in a swing of rope well-covered and making them unapproachable for Agni (fire), Salila (water), Sweda (humidity), Dhuma (smoke), Raja (dust), Mushaka (rats) and Chatushpada Abhigamanaiya (quadrupeds).

Note– Anurupa Guna is indicative of non-reacting property of vessel to the drug. In modern times the storage and packaging material of inert quality are used.

Acharya Sushruta has described the following storage materials

लोतमृद्भाण्डफलकशंकुविन्यस्त भेषजम् ।
प्रशस्तायां दिशि शुचौ भेषजागारमिष्यते ॥
(Su.Sut.36/17)

The drug should be kept in Plota (Cloth), Mridbhanda (Earthen pot), Phalaka (Wooden material) and then it should be hung with pin or rivet. The pharmacy should be constructed in right direction and place.

Storage according to Drugs and Cosmetics Rule– In schedule 'T' various store depending upon nature of raw material and finished product should be planned. The raw material should be kept in appropriate containers which would protect the quality of the raw material as well as prevent it from damage due to dampness, microbiological contamination or rodent and insect infestation etc. If certain raw materials require such controlled environmental conditions, the raw materials store may be sub-divided with proper enclosures to provide such conditions by suitable carbonization. While designing such containers, cabins or areas in the raw materials store, care may be taken to handle the following different categories of raw materials.

1. Raw material of metallic origin
2. Raw material of mineral origin
3. Raw material from animal source
4. Fresh Herbs
5. Dry herbs or plant parts
6. Excipients etc.
7. Volatile oils/Perfumes & Flavours
8. Plant concentrates/extracts/exudates/resins

Each of the container should by properly identified using label and state the status of raw material like under Test/Approved/Rejected/. All packaging materials such as bottles, jars, capsules etc. shall be stored properly and cleaned adequately and dried before packing the products.

The finished goods transferred from the production area after proper packaging and stored within an area marked 'Quarantine' After examine for its quality it is kept in approved finished Goods stock area.

Importance of Rasa, Guna, Virya, Vipaka, Prabhava

द्रव्ये रसो गुणो वीर्यं विपाकः शक्तिरेव च।
पदार्थाः पञ्च तिष्ठन्ति स्वं स्वं कुर्वन्ति कर्म च॥
रसाः स्वाद्वम्ललवणतिक्तोषणकषायकाः।
षड्द्रव्यमाश्रितास्ते च यथापूर्वं बलावहाः॥
तत्राद्या मारुतं घ्नन्ति त्रयस्तिक्तादयः कफम्।
कषायतिक्तमधुराः पित्तमन्ये तु कुर्वते॥
ये रसा वातशमना भवन्ति यदि तेषु वै।
रौक्ष्यलाघवशैत्यानि न ते हन्युः समीरणम्॥
ये रसाः पित्तशमना भवन्ति यदि तेषु वै।
तीक्ष्णोष्णलघुता चैव न ते तत्कर्मकारिणः॥
ये रसाः श्लेष्मशमना भवन्ति यदि तेषु वै।
स्नेहगौरवशैत्यानि न ते हन्युः कफं तदा॥
(Bha.Pra. Mishra Varga 180-184)

Even though drugs have got some active

principles with which they work, they have some other fractions too. Which counteract their bad effects. If any. Therefore, Ayurveda advocates that drug should be used as a whole so that the desired effects may be had without any side effects. Ayurveda propounds the principles of Rasa, Guna, Virya, Vipaka, Karma and Prabhava and attributes the actions of a drug to any one of the Rasa, Guna, Virya, Vipaka, Karma and Prabhava.

Generally, the body is nourished by Ahara and the disease is treated by Aushadha. The dietetic and medicinal substances are composed of the Panchamahabhutas (five proto elements). The health or disease is known by certain normal and abnormal functions of the Doshas in the body. If the symptoms indicate the increase of a Dosha, we have to decrease it by giving substances having predominant Panchabhautika constitution similar to that of the decreased Dosha. The combination of the Panchabhutas gives rise to six rasas.

Rasa

Definition- Rasa is the object of the gustatory sense-organ which is located in the tongue.

But it is not only perception of taste but is an indicator of the composition, properties and probable action of the drug.

Apart from the above, in Ayurveda the word rasa denotes Parada (Mercury), Swarasa (expressed) juice of a plant) and the rasa (first of the Dhatus) in the body.

Number of Rasas- There are six rasas each composed of two Mahabhuta, such as:

Rasa	Mahabhuta
Madhura	Pruthvi+ Jala
Amla	Pruthvi +Tejas
Lavana	Jala + Tejas
Katu	Vayu + Tejas
Tikta	Vayu + Akasha
Kashaya	Vayu + Pruthvi

Regarding composition of Amala and Lavana Rasa there is difference of opinion between Charaka and Sushruta. The composition given above is as proposed by Charaka, while according to Sushruta, Amla is composed of Jala + Tejas and Lavana of Pruthvi + Tejas.

Action of Rasas- Actions of rasa may be studied on the level of Doshas, Dhatus, Malas, Agni and Srotas.

Action on Dhatus- Madhura, Amla and Lavana rasas increase Kapha and decrease Vata, on the contrary, Katu, Tikta and Kashaya increase Vata and decrease kapha. The Agneya rasas (Katu, Amla and Lavana) and Saumya Rasas (Madhura, Tikta and Kashaya) increase and decrease and decrease pitta respectively.

Order of administration of Rasas

In Medicine- In treatment of diseases rasas should be used in a definite order according to Dosha as follows :

Dosha	I	II	III
Vata	Lavana	Amla	Madhura
Pitta	Tikta	Madhura	Kashaya
Kapha	Katu	Tikta	Kashaya

In diet-

I	II	III
Madhura	Amla Lavana	Katu- Tikta and Kashaya

In meals, one should start with Madhura and finish with Katu Tikta and Kashaya. In between Amala and Lavana should be taken. But if the food is excessively spicy, the meal should end with Madhura.

Rasa	Properties
Madhura	Snigdha, Shita, Guru
Amla	Snigdha, Ushna, Guru
Lavana	Snigdha, Ushna, Guru
Katu	Ruksha, Ushna, Laghu
Tikta	Ruksha, Shita, Laghu
Kashaya	Ruksha, Shita, Laghu

Guna

Definition- Guna is that which is located in Dravya inherently is causative agent and devoid of property and action.

It means that Guna itself has no action but it qualifies the Dravya for such action.

Number and classification

There are forty-one Gunas in all which can be grouped into four categories.

1. Gurvadi (Physico-Pharmacololgical) - 20
2. Paradi (Pharmacological - 10
3. Visista (Specific) - 05
4. Adhyatmika (Psychological) - 06

Total: 41

Gurvadi Gunas

They are twenty in number and in ten pairs as follows :

1. Guru	Laghu
2. Manda	Tikshna
3. Shita	Ushna
4. Snigdha	Ruksha
5. Slakshna	Khara
6. Sandra	Drava
7. Mrudu	Kathina
8. Sthira	Sara
9. Sushma	Sthula
10. Vishada	Picchila

In each pair the two partners having opposite characters balance each other. For example, if there is excess of Guru Guna, Laghu Guna Dravyas should be administered to counteract it. These Gunas are again manifestation of MahabhÏutas which are indicated by them (Gunas). As Gunas cannot be isolated in pure and abstract for the Dravya, the use of Gunas will always have to be considered in the form of Dravya. For this it is necessary to know the Dravyas in terms of Gunas.

Virya

Definition- Virya is the potency by which the drug acts. Virya is more dominant in drugs while Rasa is more dominant in dietetic substances. It is observed that there is a principle in drug which is responsible for its action and in the absence of which there is no action. It is seen in daily practice that a particular part of the plant is used and not all parts at random. The drug also loses action after a certain period or on defective processing. All this led to formation of a hypothesis regarding Virya.

Effect of Virya on Dosh

1. Shita Virya- Pacifies Pitta, aggravates Kapha and Vata
2. Ushna Virya- Pacifies Kapha and Vata, aggravates Pitta.

Vipaka

Definition- Vipaka is the transformed state of ingested substance after digestion. This is also called Nistapaka as opposed to Awasthapaka (stages of digestion) or Prapaka (initial transformation).

It is said to take place at the time of division of rasa and mala after digestion is completed. Caraka takes three Vipakas as Madhura, Amla and Katu. Madhra, Amla and Katu stand for Kapha, Pitta and Vata respectively.

Effect of Vipakas

According to Charaka-

Vipaka	Guna	Dosha
Madhura	Snigdha, Guru	Kapha increasing
Amla	Snigdha, Laghu	Pitta increasing
Katu	Ruksha, Laghu	Vata increasing

According to Sushruta

Vipaka	Dosha
Guru	Kapha increasing Vata pitta decreasing
Laghu	Vata pitta increasing Kapha decreasing

Karma

Definition- Karma is that which causes Samyoga (conjunction) and Vibhaga (disjunction)

irrespective of any other factor and is located in Dravya. In the context of pharmacology this relates to action on organs, Doshas, dhatus and malas which is required for homeostasis of the person. In other words, Karma is the response of the living tissue to Dravya.

Theory of drug action

The mode of action of the drugs is based on the theory of Pachamahabhuta. As said above, the body is composed of five Mahabhutas and similar is the composition of drugs. Drugs when used combine with the selective Mahabhutas and by altering its quantity and quality produce their action by further influencing the respective Doshas, Dhatus and Malas accordingly. This is a sort of selective mechanism more or less like the lock and key theory based on structure function relationship . As in the living body pa.ca Mahabhuta is represented by Tridosha there is a tradition of describing the action in terms of Doshas instead of Mahabhutas. The Bhautika state of drugs on the other instead of Mahabhutas. The Bhautika state of drugs on the other side is indicated by Rasa.

For instance, if Madhura rasa (Parthivapya) is administered it would thereby increase the kapha Dosha Dhatus like Rasa, Mamsa, Medas, Majja and Shukra and Malas like stool and urine which have predominance of Pruthvi and Apa Dhatus. Reverse will be the effect on administration of Tikta Rasa.

Prabhava

Definition- The specific potency of a drug is known as Prabhava.

Nature of Prabhava- It is seen that two drugs though having similar Rasa, Vipaka and Virya differ in action. This difference in action is owing to the specific chemical (Bhautika) composition of the drug and its action cannot be explained by general rule on the basis of Rasa, Vipaka and Virya. For instance, Danti and Chitraka are similar in Rasa (Katu), Vipaka (Katu) and Virya (Usha) but the former is purgative in action while the latter is not.

On the side of body response, the drugs action on specific tissue, organ or disorder is said to have Prabhava and the action is directed to disease and not towards Dosas. For instance, cardiotonic action of Arjuna, anthelmintic activity of Vidanga, antitoxic effect of Shirisha are said to be due to Prabhava.

Anukta Visheshokta Grahana

There are certain specific things that must be taken until in a formulation it is not specified. It is as follows:

कालेऽनुक्ते प्रभातं स्यादङ्गेऽनुक्ते जटा भवेत्।
भागेऽनुक्ते तु साम्यं स्यात् पात्रेऽनुक्ते च मण्मयम्।
द्रवेऽनुक्ते जलं ग्राह्यं तैलेऽनुक्ते तिलोद्भवम्॥
(Sha.Pra. 1/47-48)

1. If time is not said – Prabhata (early morning) is accepted
2. Part used not said – Jata (root) should be taken
3. Ratio is not said – Equal part should be taken
4. Vessel is not said– Earthen pot is accepted
5. Drava (Liquid) is not told - Water should be taken
6. Taila is not said - Tila Taila should be taken like wise.

चूर्णस्नेहासवा लेहाः प्रायशश्चन्दनान्विताः।
कषायलेपयोः प्रायो युज्यते रक्तचन्दनम्॥
(Sha. Pra. 1/50)

In Churna, Sneha, Asava, Leha – Normally Shweta Chandana is used.

In Kashaya, Lepa - Rakta Chandana should be used.

Anukta Avayava Dravya Anga Grahana

अतिस्थूलजटा याः स्युस्तासां ग्राह्यस्त्वचो बुधैः।
गृह्णीयात्सूक्ष्ममूलानि सकलान्यपि बुद्धिमान॥
न्यग्रोधदिस्त्वचो ग्राह्याः सारः स्याद्बीजकादितः।
तालीसादेश्च पुष्पाणि फलं स्याद् त्रिफलादितः॥
धातक्यादेश्च पुष्पाणि स्नुहीदेः क्षीरमाहरेत्।
(Sha. Pra. 1/60-61)

Sr. No.	Anukta	Parts taken
1.	Atisthoola Jata (Big root)	Twak (Bark)
2.	Plants having small root branch	Total parts (Root, Leaf flower and should be taken
3.	Nygrodha	Twak (Bark)
4.	Beejaka	Sara (Heart wood)
5.	Talisa	Patra
6.	Triphala	Phala (Fruit)
7.	Dhataki	Pushpa (Flower)
8.	Snuhi	Ksheera (Latex)

Aushadha Namakarana: Naming Preparation

यद्धि येन प्रधानेन द्रव्यं समुपसृज्यते।
तत्सज्ञंक स योगो वै भवतीति विनिश्चयः॥
(Cha. Kal. 12/43)

The Yogas are invariably named after the main (Most active) drug used in their composition.

According to Acharya Sharangadhara

यदौषधं तु प्रथमं यस्य योगस्य कथ्यते।
तन्नाम्नैव स योगो हि कथ्यतेऽत्र विनिश्चयः॥
(Sha. Purv. 1/36)

In this text with reference to formulation, which drug is said first then the name of the formulation will be according to name this Aushadhi.

Besides these there are some other Namakarana Aadhar which are stated below :

- According to Roga Nama (indication in disease name)– Kushthari Rasa, Jwarmurari Rasa, Kushtahara Lepa etc.
- According to Shape– Rasa Parpati (Parpata like)
- According to Varna– Rasa Sindoor (Sindoor Varna), Rasa Manikya (Manikya Varna), Swarna Vanga (Swarna Varna).
- According to weapon of God– Sudarshana Churna
- According to first ingredients– Chitrakadi vati, Abhyarishta
- According to Mana of ingredient– Kamsa Haritaki (Haritaki is taken one Kamsa Pramana)
- According to person who used if first– Chavyanprasha
- According to Prabhava and Guna– Brihat Gangadhara Churna

सर्वातिसार ग्रहणी प्रशमं याति वेगतः।
वृद्धगङ्गाधरं चूर्ण सरिद्वेगस्य रोधकम्॥
(Sha.Pra. 6/51)

- On the name of God – Narayana Churna
- According to manufacturer– Shri Bahushala Guda
- According to its special Prabhava - Sanjivani Vati

सञ्जीवनी कथिता यतोऽस्याः प्रभावान्मानवो यदा मुमूर्षस्तदा जीवतीति। विचारणात्र न कार्या, अविचिन्त्यो हि मणिमन्त्रौषधीनां प्रभावः – (Adhamalla)

- According to its chief ingredients – Yogaraj Guggulu. Triphala Guggulu
- According to Nakshatra – Pushyanuga Churna
- According to its time of action – Ashtaayanika Vati

Aushadha Sevana Kala: Time of Drug Administration

Aushadha Sevan Kala as per Acharya Charaka

भैषज्यकालो भुक्तादौ मध्ये पश्चान्मुहुर्मुहुः।
सामुदगं भक्तसंयुक्तं ग्रासग्रासान्तरे दश॥
(Cha.Chi. 30/298)

There are 10 time period for administration of medicine.

1. Prata (Early morning empty stomach)
2. Adya (Before meal in noon)
3. Madhya (Between meal)
4. Pashchata (After meal -in the noon/morning)
5. PshachataAfter meal (in the evening)
6. Muhurmuhu (repeated dose)
7. Samudga (before and after meal at a time)
8. Sabhakata (with meal)

9. Grasa (with bite)
10. Grasantra (between bite/morsel)

These 10 Bhaishajya Kala are adopted in specific conditions which is as follows :

अपाने विगुणे पूर्वं समाने मध्यभोजनम्।
व्याने तु प्रातरशितमुदाने भोजनोत्तरम्॥
वायौ प्राणे प्रदुष्टे तु ग्रासग्रासान्तरिष्यते।
श्वासकासपिपासु त्ववचार्य मुहुर्मुहुः॥
सामुदगं हिक्किने देयं लघुनाऽन्नेन संयुतम्।
सम्भुक्तं त्वौषधं भोज्यैर्विचित्रैररूचौ हितम्॥

(Cha. Chi. 30/299-301)

Sr. No.	Aushadha kala	Indication
1.	Bhojana Purva (before meal)	Apana Vata Vikriti
2.	Madhya Bhojana (interval between 2 meal)	Samana Vata Vikriti
3.	Pratah Bhojana Purva	Samana Vata Vikriti
4.	Prahah Bhojana Pashchata	Udana Vata Vikriti
5.	Sayan Bhojana Pashata	-
6.	Grasa	Prana Vata Vikriti
7.	Grasantara	-
8.	Muhurmuhu	Shwasa, Kasa, Pipasa
9.	Samudaga	Hikka with Laghu Anna
10.	Sabhakta	Aruchi

According to Aacharya Sushruta

अत ऊर्ध्वं दशौषधकालान् वक्ष्यामः। तत्राभक्तं प्राग्भक्तमधोभक्तं मध्ये भक्तमन्तराभक्तं सभक्तं सामुद्गं मुहुर्मुहुर्ग्रासं ग्रासन्तरं चेति दशौषधकालाः॥ (Su.Ut. 64/65)

Here 10 Aushadha Kala are described these are Abhakata, Pragabhakta, Adhobhakta, Madhyabhakta, Antarabhakta, Sabhakta, Samudaga, Muhurmuhu, Grasa and Grasantra.

Sr. N.	Aushadha Kala	Sushruta Acharya	Vagbhata Acharya
1	Abhakta	Adhika Gunakari (best)	Kaphodreka
2	Pragbhakta	Vriddha, Shishu, Bhiru	Apanavata Vikrit,Kaya Baladhana
3.	Adhobhaka	Urdwakayagata Roga	Vyan Vata-After meal (morning) Udanvata-After meal (evening)
4.	Madhye Bhakta Roga	Madhodara	
5.	Antra Bhakta	Hridya Manobal Kara Deepana	Vyana Vata Vikriti
6.	Sabhakta	Bala, Vriddha, Aushadha Dwishi	Bala, Kumar, Aushadha Dwishi
7.	Samudaga	When dosha is Urdhava and Udho part	Kampa, Aakshepa, Dosha Urdhwa and Udho
8.	Muhurmuhu	Shwasa, Hikka, Vamana	Shwasa, Kasa, Trishna
9.	Grasa	Vajikarana, Deepana	Vajikarana, Deepana
10.	Grasantara	Shwasa Vamniya Dhooma	Pranavata Vikriti, Hridroga
11.	Nishi	-	Urdhvajatrugati Roga

Aushadha Sevan Kala according to Sharangadhara

भैषज्यमभ्यवहरेत्प्रभाते प्रायशोवुधः।
कषायांश्च विशेषेण तत्र भेदस्तु दर्शितः॥

(Sha.Pra. 2/1)

Generally, Aushadha should be administered at the morning. According to different diseases here different Kala are described.

ज्ञेयः पञ्चविधः कालो भैषज्यग्रहणे नृणाम्।
किञ्चितसूर्योदये जाते तथा दिवस भोजने॥
सायन्तने भोजने च मुहुश्चापि तथा निशि।

There are five Aushadha Sevana Kala :

1. Sometime after from sunrise

2. Related to Divas Bhojana
3. Related to Sayankala Bhojana
4. Muhurmuhu
5. Nishi

प्रायः पित्त कफोद्रेके विरेक वमनार्थयोः ॥
लेखनार्थ च भैषज्यं प्रभाते तत्समाहरेत् ।
एवं स्यात्प्रथमः कालो भैषज्य ग्रहणे नृणाम् ॥
(Sha. Mad. 2/3-4)

The first Kala is Prabha Kala it is followed for Pitta Kapha Reka, Virechana and Vamana.

भैषज्यं विगुणेऽपाने भोजनाग्रे प्रशस्यते ।
अरुचौ चित्रभोज्यैश्च मिश्रं रुचिरमाहरेत् ॥
समानवाते विगुणे मन्देऽग्नावग्निद्वीपनम् ।
दद्याद्भोजनमध्ये च भैषज्यां कुशलो भिषक् ॥
व्यानकोपे च भैषज्यं भोजनान्ते समाहरेत् ।
हिक्काक्षेपक कम्पेषु पूर्वमन्ते च भोजनात् ॥
एवं द्वितीयकालश्च प्रोक्तो भैषज्यकर्माणि ।
(Sha. Mad. 2/5-7)

Divasa Bhojana–

- Bhojanagra - Apana Vata Vikriti
- Bhojana Madhya - Saman Vata Vikriti and Madagni
- Bhojanamte - Vyan Vata Kopa
- Bhojana Purva and Anta - Hikka, Akshapa, Kampa

उदाने कुपिते वाते स्वरभङ्गादिकारिणी ।
ग्रासे ग्रासन्तरे देयं भैषज्यं सान्ध्य भोजने ।
प्राणे प्रदुष्टे सान्ध्यस्य भुक्तस्याते च दीयते ॥
औषधं प्रायशो धीरैः कालोऽयं स्यात्तृतीयकः ।
(Sha. Mad. 2/8-9)

Sayanta Bhojanakala–

Grasantra – Udana Kopita and Swarabhanga

Bhojananta – Pranavata Dushti

मुहुर्मुहुश्च तृट्छर्दि हिक्का श्वासः गरेषु च ।
सान्नं च भेषजं दद्यादिति कालश्चतुर्थकः ॥
(Sha. Mad. 2/10)

In Muhurmuha, Bheshaja is administered with Anna in the disease like Trishna, Chardi, Hikka, Shwasa Roga.

ऊर्ध्वजत्रु विकारेषु लेखने बृहंणे तथा ॥
पाचनं शमनं देयमन्नं भेषजं निशि ।
इति पञ्चमकालः स्यात् प्रोक्तो भैषज्य कर्मणि ॥
(Sha. Mad. 2/11-12)

Nishi Bheshaja, Kala is advised without food in Urdhva Jatrugata Vikar, Lekhana, Brimhana, Pachana and Shamana.

Table showing Aushadha Sevan Kala according to different Acharya

Sr. No.	Charaka	Sushruta	Vriddha Vagbhatta	Sharangadhara	Kashyapa
1.	Prataha Niranna	Abhakta	Abhakta	Kinchita Suryodaya	Without Bhojana
2.	Bhojan Purva	Pragabhakta	Pragbhakta	Divas Bhojana	Bhojana Purva
3.	Bhojana Madhya	A dhobhakta	Adhobhakta	Saya Bhojana Paschata	
4.	Pratah. Bhojahan Pashchata	Madhya Bhakta	Madhya Bhakta	Muhurmahu	Bhojana Anta
5.	Sayamkala Bhojan Paschata	Antrabhakta	Antrabhakta		Samudga
6.	Muhurmuhu	Sabhakta	Sabhata	–	Muhurmuhu
7.	Samudaga	Samudaga	Samudaga	–	Sabhakta
8.	Bhakata Samjukta	Muhurmuha	Muhurmuhu	–	Bhakta Madhya
9.	Grasa	Sagrasa	Sagrasa	–	Grasa
10.	Grasantra	Grasantra	Grasantra	–	Grasantra
11.	–	–	Nishi	Nishi	–

Saveeryata Avadhi (Shelf life of different Kalpana)

The word Saviryata Avadhi means the time period during which any drug possesses its Virya and able to perform its specific action. The definition of Virya is as follows.

शीतोष्णमिति वीर्य तु क्रियते येन या क्रिया।
नावीर्य कुरूते किंचित सर्वा वीर्यकृता क्रिया॥
(Cha.Sutra. 26/65)

That is Virya is of two types namely Sheeta and Ushna. By means of Virya, Dravya is able to perform its action. Without Virya no action can be performed all action are subjected to Virya.

The Saviryatavadhi is that specific time period during which any drug is able to perform its action. It can be correlated with Shelf life or stability period.

Definition of Shelf Life– In modern time the term ''Shelf life'' is used to indicate the time period during which an Active Pharmaceutical Ingredient (API) of Finished Pharmaceutical Product (FPP) is expected to remain within the approved stability specification, provided that it is stored under the conditions defined on the container level.

Ayurvedic concept on Saviryatavadhi

In Brihatrayi there is no description of Saviratavadhi in terms of time period but it is available in codified form that is–

विगन्धेनापरामृष्टमविपन्नं रसादिभिः।
नवं द्रव्यं पुराणं वा ग्राह्यमेव विनिर्दिशेत्॥
(Su. Sutra. 36/15)

Whether Dravya is fresh or old (Purana) it is acceptable for various purpose if its Gandha (Smell), Rasa (Taste), Varna (Colour) are not detoriated detoriated in any aspect.

The above description regarding acceptance of any drug may be Nava or Purana is indicative of stability in primitive form where Dravya is assessed by its natural Gandha, Rasa, Varna etc. Saviryata Avadhi in terms of time period according to various Kalpana is available in the text like Sharangadhara Samhita, Yogaratnakara.

According to Yoga Ratnakara

क्वाथस्य कल्कस्य रसस्य यामं मास त्रयं चाञ्जन चूर्ण वीर्यम्। षण्मासवीर्य गुडलेहयोश्च संवत्सरं तैलकृतस्य वीर्यम्॥
(Yog. Rat. Jwa. Chi Aush. Vich. 4)

Swarasa, Kwatha and Kalka for 3 hours (1 Yama), Anjana and Churna for 3 months, Guda and Avaleha for 6 months and Taila and having Virya for one year.

According to Acharya Sharangadhara

गुणहीनं भवेद्वर्षादूर्ध्वं तद्रूपमौषधम्।
मासद्वयात्तथा चूर्ण हीनवीर्यत्वमाप्नुयात्॥
हीनत्वं गुटिकालेहौ लभेते वत्सरात्परम्।
हीनाः स्युर्घततैलाद्याश्चतुर्मासाधिकात्तथा॥
ओषध्यो लघुपाकाः स्युर्निवीर्या वत्सरात्परम्।
पुराणाः स्युर्गुणैर्युक्ता आसवा धातवो रसाः॥
(Shra.Pra. 1/51-53)

The raw drug stored, in the form in which it is collected, Tadrupamaushadham means the drug which is not converted into any dosage form i.e. Churna, Vati etc.-Adhamalla) becomes Gunahina after one year or within one year. Churna in 2 months, Gutika and Avaleha in one year becomes Hina Virya. Ghrita and Taila become Hina Virya in sixteen months. Laghu Paki Aushadhi becomes Nirvirya after one year. Asava, Dhatu (Bhasma) Rasa (Bhasma or Rasaushadhi) are Guna Yukta while being Purana.

Table showing Saviryatavadhi according to different text

Sr. No.	Dosage form	Saviryatavadhi	
		As per Sharangadhara	As per Yogaratnakara
1.	Swarasa	–	3 Hours
2.	Kalka	–	3 Hours
3.	Kwatha	–	3 Hours
4.	Anjana	–	3 Months
5.	Churna	2 Months	3 Months
6.	Vati	1 Year	–
7.	Guda/ Avaleha	12 Months	6 Months

8.	Ghrita/ Taila	16 Months	12 Months (Taila)
9.	Aasava	Dirgha Kala	–
10.	Dhatu	Dirgha Kala	–
11.	Rasa	Dirgha Kala	–

Shelf life of Ayurvedic Drug in Today's Period

Shelf life or date of expiry of medicines– The date of expiry of Ayurvedic, Siddha or Unani medicines shall be conspicuously displayed on the label of container or package of Ayurvedic, Siddha or Unani medicines, as the case may be, and after the said date of expiry, no medicine shall be marketed, sold, distributed or consumable.

Provided that this rule shall apply to Ayurvedic, Siddha and Unani medicines seeking licence or renewal of licence for manufacturing after the date of notification of the rules.

Provided also that this rule shall not be applicable to the Ayurvedic, Siddha or Unani medicines manufactured and marketed prior to the date of this notification.

The shelf life or date of expiry of an Ayurveda, Siddha or Unani medicine defined under clause (a) of section 3 of the Act shall, unless otherwise determined on the basis of scientific data, be as follows:–

Ayurvedic Medicines

S. No.	Dosage form expiry with effect from the date of manufacture	Shelf life or date of
	(1)	(2)
	Anjana	
(i)	(a) Anjana made from Kasth-aushadhi	1 year
	(b) Anjana made from Kastha-ushadhi along with Rasa/Uprasa/Bhasma	2 years
	(c) Anjana made only from rasa/Uprasa/Bhasma	3 years
(ii)	Arka	1 year
(iii)	Asava Arista	10 years
(iv)	Avaleha, Khanda, Paka, Guda	3 years
(v)	Churna, Kwatha Churna, Lepa Churna, Danta Manjan (Churna)	2 years
(vi)	Dhoopan	2 years
(vii)	Dravaka, Lavana, Kshara	5 years
(viii)	Ghrita	2 years
(ix)	Guggulu	5 years
(x)	Gutika/Vati (I) Gutika or Vati containing Kasthaushadhi along with Rasa/Uprasa/Bhasma/Guggulu (including Lepa Gutika and Ghan Vati)	5 years
	(II) Gutika or Vati containing only Kasthaushadhi (including Lepa Gutika and Ghan Vati)	3 years
	(III) Gutika/Vati containing only Rasa/Uprasa/ Bhasma except Naga, Vanga and Tamra Bhasma	10 years
(xi)	Karna/Nasabindu	2 years
(xii)	Kupipakva Rasayana	10 years
(xiii)	Malhar	3 years
(xiv)	Mandur-Lauha	10 years
(xv)	Naga Bhasma, Vanga Bhasma and Tamra Bhasma	5 years
(xvi)	Netrabindu	1 year
(xvii)	Parpati	10 years
(xviii)	Pisthi and Bhasma except Naga, Vanga and Tamra	10 years
(xix)	Pravahi Kwatha	3 years
(xx)	Rasayoga (I) Rasayoga containing only Rasa/Uprasa/Bhasma except Naga	10 years
	(II) Rasayoga containing Rasa/Uparasa/Bhasma along with Kasthaushadhi/ Guggulu	5 years
(xxi)	Sattva (derived from medicinal plant)	2 years

(xxii)	Sharkar/Panak/Sharbat	3 years
(xxiii)	Shveta Parpati	2 years
(xxiv)	Taila	3 years
(xxv)	Varti	2 years

Aushadha Matra: Dosage/Posology

It is concluded while going through various Ayurvedic text the Aushadha Matra depends on Agni Bala of patient as well as condition of disease. So Aacharya Charaka has not given any fixed amount of Aushadhi but instructed that it should be given after proper examination of Bala, Agni etc. Aacharya Sushruta has given dose of various Kalpana in the Madhyam Vyadhi Bala stage. Aacharya Kashyapa along with Sharangadhara and Yogaratnakara have given detailed dose with respect to children. It may be concluded that after the period of Charaka there may be difficulty in dose fixation so Acharya of later period have given fixed dose according to Vaya-Bala etc.

Concept of Acharya Charaka

नाल्पं हन्त्यौषधं व्याधि यथाऽऽल्पोऽल्पा महानलम्।
दोषवच्चातिमात्रं स्यात्सस्यात्युदकं यथा॥
सम्प्रधार्य बलं तस्मादामयस्यौषधस्य च।
नैवातिबहु नात्यल्पं भैषज्यमवचारयेत्॥
(Cha. Chi. 30/313-14)

As a small quantity of water cannot extinguish fire, likewise medicine in small amount cannot cure a disease. As irrigation with over flood is harmful for the crops similarly medicine in large dose is harmful for patient. So, after careful examination of strength of disease and medicine the remedial measures should be given in dose which is neither too much nor too less.

दोष प्रमाणानुरूपो हि भैषज्यप्रमाणविकल्पो बल प्रमाण विशेषापेक्षो भवति। (Cha.Vi. 8/94)

According to magnitude of Doshas, the dose of drug is decided and Bala Pramana matters especially. It is also said in content of Kashaya Kalpana.

तेषां यथापूर्व बलाधिक्यम्, अतः कषायकल्पना व्याध्यातुरबलापेक्षिणी, न त्वेवं खलु सर्वाणि सर्वत्रोपयोगीनि भवन्ति॥ (Cha. Sutra. 4/711)

The potentiality of the Kashaya Kalpana viz. Swarasa, Kalka etc. of the preceding category is greater than the succeeding ones; so all these Kalpana should be administered with respect to the strength of the patient and condition of disease. All these Kashaya Kalpanas are not equally useful in all conditions.

Dose according to Acharya Sushruta– Acharya has indicated the following dose according to Madhyama Bala of Vyadhi.

व्याध्यादिषु तु मध्येषु क्वाथस्याञ्जलिरिष्यते।
विडालपदकं चूर्णे देयः कल्कोऽक्ष संमितः॥
(Su.Su. 39/14)

If Vyadhi, Agni and Rogi Bala is Madhyama then Kwatha 4 Pala, Churna 1 Vidalpadaka (1 Tola) and Kalka 1 Aksha (1 Tola) is used.

Dose of Aushadhi as per various text can be summarised as follows–

Sr. No	Kalpana	Sushruta Samhita	Ashtanga Samgraha	Ashtanga Hridaya	Sharangadhara Samhita	Bhava Prakash
1.	Swarasa	–	4 Pala	4 Pala	**1/2** Pala Agnisiddha-1 Pala Nishoshita-1 Pala	1/2 to 1 Pala
2.	Puta paka Swarasa	–	–	–	1 Pala	–
3.	Kalka	1 Aksha	1 Karsha	1 Karsha	1 Karsha	1 Karsha
4.	Kwatha	1 Anjali	–	–	2 Pala	1 Pala 3 Karsha 1/2 Pala

5.	Hima	–	–	–	2 Pala	2 Pala
6.	Phanta	–	–	–	2 Pala	2 Pala
7.	Mantha	–	–	–	2 Pala	2 Pala
8.	Chruna	1 Vidal padaka	1Karsha	1 Karsha	1 Karsha	1 Karsha
9.	Vati	–	–	–	1 Karsha	1 Karsha
10.	Avaleha	–	–	–	1 Pala	1 Pala
11.	Sneha	–	–	–	1 Pala	1 Pala
12.	Aasava/					
	Arishta	–	–	–	1 Pala	-

Dose according to Acharya Kashyapa

Kashyapa Samhita mainly deals with the medicinal aspect related to children. In this text dose of medicine is given according to age of child. Here age is divided into three category like Garbha, Bala and Kumar. Again it is divided into Yauvana, Madhyama and Vriddha. The word Ksheerapa is used upto the age of one year when child is dependent on milk only and it is Balavastha. From on year upto sixteen years it is termed as Annada or Kumaravastha while Yuvavastha is starting from sixteen years upto thirty-four years. From 34 to 70 years, it is Madhyamavastha and from 70 years till death it is known as Vriddhavastha.

Dose of Aushadhi as per different Acharyas

Sr. No	Age	Dose as per Aacharya Kashyapa	According to Sharangadhara	According to Acharya Vishvamitra
1.	0-6 days	equal to seed of small Badara	–	1 Vidanga phala (Jatamatra)
2.	6-10 days	More to seed of small Badara	–	–
3.	10-20 days	Kolardha	–	–
4.	20-30 days	1 Kola	–	–
5.	1 month	more than 1 Kola	1 Ratti	1 Vidana phala
6.	2 month	more than 1 Kola	2 Ratti	2 Vidanga phala
7.	3 month	2 Kola	3 Ratti	3 Vidanga phala
8.	4 month	equal to dry Amalaki	4 Ratti	4 Vidanga Phala
9.	5 month	equal to Aardra Amalaki	5 Ratti	5 Vidanga Phala
10.	6 month	equal to Aardra Amalaki	6 Ratti	6 Vidanga Phala
11.	7 month	little more than Aardra Amalaki	7 Ratti	7 Vidanga Phala
12.	8 month	more than Aardra Amalaki	8 Ratti	8 Vidanga phala
13.	9 month	–	9 Ratti	9 Vidanga phala
14.	10 month	–	10 Ratti	10 Vidanga phala
15.	11 month	–	11 Ratti	11 Vidanga phala
16.	12 month	–	12 Ratti=1.5g	12 Vidanga phala
17.	Kshee Annada	Agni Bala	–	Kola Matra
18.	Annada	Mushti, Pala Prasrata or Anjali Pramana	–	Udumbara Matra

Note– Acharya Sharangadhara has indicated that after one year 1 Masha of Aushadhi, increase per year should be given upto 16 years i.e. 16 Masha. This dose (16 Masha) is applicable to 70 years old person too. After that it decreases this dose pattern is for Kalka and Churna. The dose of Kashaya is 4 times to that of it.

Age	Dose	Age	Dose	Age	Dose
1 yr.	1.5 g	6 yr.	5.250 g	11 yr.	9.0 g
2 yr.	2.250 g	7 yr.	6.0 g	12 yr.	9.750 g
3 yr.	3.0 g	8 yr.	6.750 g	13 yr.	10.5 g
4 yr.	3.750 g	9 yr.	7.5 g	14 yr.	11.250 g
5 yr.	4.5 g	10 yr.	8.250 g	15 yr.	12.0 g
				16-70 yr.	12.750 g

Anupana & Sahapana (Adjuvant)

Definition of Anupana

तत्तद्रोगघ्नभैषज्यं भेषजस्यानुपीयते ।
यच्च साहाय्यकारि स्यादनुपानं तदुच्यते ॥
(R.T. 6/200)

Anupana is an adjunct administered either along with or just after the principal medicine to enhance its therapeutic action. (When administered with the principal medicine it is described as Sahapana though is practice the term Anupana connotes both.

Anupana is described in Annapana Vidhi of 27th chapter of Sutrasthan Charaka Samhita and in the 46th Chapter of Sutrasthan of Sushruta Samhita viz.

अतः सर्वानुपानान्युपदेक्ष्यायः।

Role of Anupana on Bheshaja

यथा तैलं जले क्षिप्तं क्षणेनैव प्रसर्पति ।
अनुपानबलादङ्गे तथा सर्पति भेषजम् ॥
(Sha. Madh. 6/5)

When drops of oil are poured over water then it spread over water in short time period likewise Anupana forcefully delivers the medicine to all over body.

Advantage of proper Anupana intake

अनुपानं हितं युक्तं तर्पयत्याशु मानवम् ।
सुखं पचति चाहारायायुषे च बलाय च ॥
(Cha.Su. 27/326)

According to Aacharya Charak when proper Anupana is been taken then it quickly provides Tarpana, digest the food in well manner way, provides Ayu and Bala.

Uttama Anupana

यदाहारगुणैः पानं विपरीतं तदिष्यते ।
अन्नानुपानं धातूनां दृष्टं यन्न विरोधि च ॥
(Cha.Su. 27/319)

The liquid Dravya which has opposite properties to that of Aahara that is suitable Anupana for that particular Anna Dravya but this Anupana should not opponent to Dhatus.

Properties of Anupana

रोचनं बृंहणं वृष्यं दोषसङ्घात भेदनम् ।
तर्पणं मार्दवकरं श्रमक्लमहरं सखम् ॥
दीपनं दोषशमनं पिपासाच्छेदनं परम् ।
बल्यं वर्णकरं सम्यगनुपानं सदोच्यते ॥
(Su.Su. 46/442-43)

Samyaka Anupana is Rochaka, Brimhana, Vrishya, Dosha Sanghata Bhedaka, Tarpaka, Mardavakara, Shramklamhara, Sukhakara, Deepana, Dosha Shamaka, Pipasa Chhedadaka. It is Parama Balya and Varnakara.

Yougika Dravya Siddhanta (Drug Combination)

फलादीनां प्रधानानां गुणभूताः सुरादयः ।
ते हि तान्यनुवर्तन्ते मनुजेन्द्रमिवेतरे ॥
(Cha. Kal. 12/44)

Alcohol etc. used along with the chief ingredients like Madan Phala play as secondary role. Their effects follow the attributes of the main ingredients used in the Yoga as the attendants follow the king.

Role of Viruddha Virya drug in a formulation

विरूद्धवीर्यमत्येषां प्रधानानामबाधकम् ।
अधिकं तुल्यवीर्ये हि क्रियासामर्थ्यमिष्यते ॥
इष्टवर्णरसस्पर्श गन्धार्थं प्रति चामयम् ।
अतो विरुद्ध वीर्याणां प्रयोग इति निश्चितम् ॥
(Cha. Kal. 12/45-46)

If the drug of secondary nature has Viruddha Virya action even then they do not contradict the effect of main drug. If these drugs are similar in potency to that of chief drug, then the Yoga becomes all the more effective therapeutically. Drugs having Viruddha Virya Guna (Anatagonistic property) are added to a formulation in order to import desirable colour, taste, touch and smell. Such addition also helpful to effectively cure the diseases.

Role of Bhawana

भूयश्चैषां बलाधानं कार्यं स्वरस भावनैः ।
सुभावितं ह्यल्पमपि द्रव्यं स्याद्बहुकर्मकृत् ॥
स्वरसैतुल्यवीर्येर्वा तस्माद्रव्याणि भावयेत ॥
(Cha. Kalp. 12/47)

To increase the potency of a drug/formulation, it is necessary to give the Bhawana with the juice or decoction of other drugs. When it is properly Bhawita even a small quantity of the drug becomes exceedingly effective.

Modifying to effect of formulation

अल्पस्यापि महार्थत्वं प्रभूतस्याल्पकर्मताम् ।
कुर्यात संयोग विश्लेष काल संस्कार युक्तिभिः ॥
(Cha. Kalp. 12/48)

There are certain procedure by virtue of that even a small quantity of drug may produce more powerful effects, and otherwise even a formulation in large quantity may produce very mild effects these procedures are–

1. Samyoga (Addition of ingredients)
2. Vishlesha (Elimination of ingredients)
3. Kala (Proper time of administration of drug)
4. Samskara (Different pharmaceutical procedure)

These are the concept that should be kept in mind while going for a formulation.

4 CHAPT. Chronological Development of Ayurvediya Aushadhi Nirmana

Syllabus

Principles involved, currently used yantras, their correlation, utility, and Instruments used in Large scale Production- Dola Yantra, Valuka Yantra, Puta Yantra, Khalwa Yantra, Patana Yantra, Darvika Yantra, Ulukhala Yantra, Patala Yantra, Kupi Yantra, Arkapatana Yantra, Pithara Yantra, Sharava Yantra, Palika Yantra, Sthali Yantra, Swedana Yantra, Vidyadhara Yantra **Modern Machinery-** Grinder Disintegrator, Pulverizer, Powder Mixer, Mechanical sifter, Ball mill, Granulator, Dryer, Tablet compressing machine, Pills making machine, Coating pan, Polishing pan, End runner machine, Edge runner machine, Capsule filling machine, Ointment mixer, Tube filling machine, Sieves & Meshes, Liquid filling machine, Distillation plant, Strip packing machine, Pouch filling, Pyrometer

Learning objectives

- Choose and record contemporary machines used in Ayurvedic drug preparation.
- Discuss the pharmaceutical use of Distillation apparatus, Ball Mill, Pulveriser, End Runner, Edge Runner, Tablet compression machine, Capsule filling machine, Pouch filling machine, Liquid filling machine in Ayurvediya Aushadhi Nirmana.
- Describe the principles behind construction and working of the classical Yantras used for Ayurvediya Aushadhi Nirmana.
- Enlist categorical information about the following Yantras in the charts- Ulukhal Yantra, Patan Yantra, Jarana Yantra, Patala Yantra and Swedana Yantra.
- Interpret the mechanism and effect of Yantras / machines on the Physical and Chemical properties of the drug material.
- Enlist Ayurvediya Aushadhi Kalpana and equipment's/yantras/ machines used for preparation of each Kalpana.

Total - 10 hours (Lecture :06 hour, Non-lecture: 04 hours)
Marks- 5 marks, LAQ (10 Marks)- No, SAQ (5 Marks)- Yes, MCQ- Yes

Introduction

The instruments used for the purpose of purification, incineration etc. of Rasa, Uparasa, Dhatus and also used for the purification of Parada, are discussed in this chapter.

Purification of Parada and other metallic and mineral substances by the method of Shodhana and Marana is dependent on Yantras. For these procedures various types of Yantras are used.

Definition of Yantra

स्वेदादिकर्म निर्मातुं वार्तिकेन्द्रैः प्रयत्नतः।
यन्त्र्यते पारदो यस्मात्तस्माद्यन्त्रमिति स्मृतम्॥
(R.R.S. 9/2)

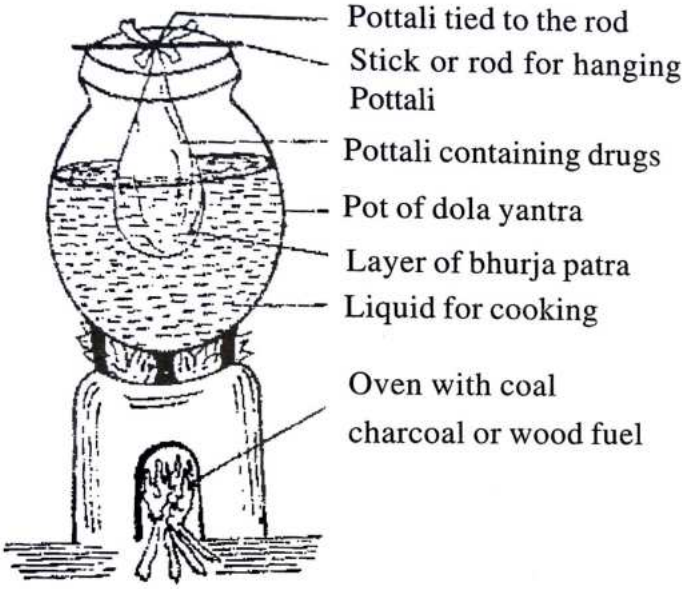
रसो नियन्त्रयते येन यन्त्रं तदिति उच्यते।
(आ.क. 26/1)

रसोपरसलोहाद्यः मारणाद्यर्थसिद्धये।
यन्त्र्यन्त नेन यस्मात्तु तस्मात् यन्त्रं प्रकीर्तितम्॥
(र.त. 4/1)

The Yantra is the measure by which the specialist of Rasa Shastra controls the Parada during the Svedana etc. procedure with conation.

After studying all the Rasa Tantra texts critically the various apparatuses invented by the highly expert scholars (alchemists) taking all possible care, are being mentioned here precisely by Soma Deva to perform Swedana (eating through liquids/vapours) procedures.

Dola Yantra

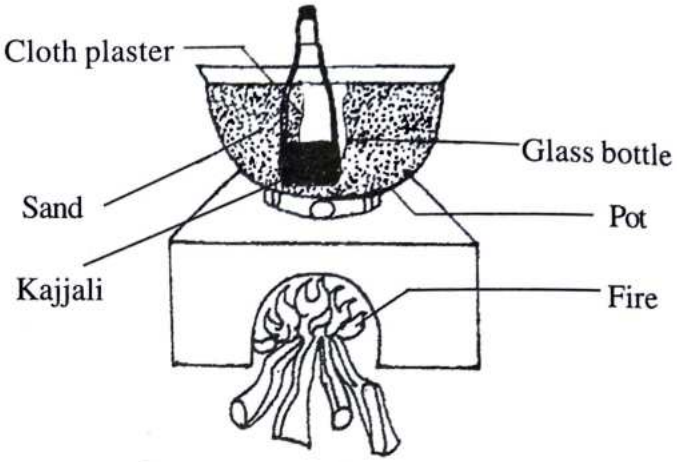

Pottali tied to the rod
Stick or rod for hanging Pottali
Pottali containing drugs
Pot of dola yantra
Layer of bhurja patra
Liquid for cooking
Oven with coal charcoal or wood fuel

द्रवद्रव्येण भाण्डस्य पूरितार्धोदकस्य च।
मुखस्योभयतो द्वारद्वयं कृत्वा प्रयत्नतः॥
तयोस्तु निक्षिपेद्दण्डं तन्मध्ये रसपोटलीम्।
बद्ध्वा तु स्वेदयेदेतद्दोलायन्त्रमिति स्मृतम्॥
(R.R.S. 9/3-4)

An earthen vessel is taken and two holes are made on both sides of the neck of vessel in which a rod is put. The vessel is filled half with the required liquid. The substance (to be processed) kept in cloth pouch is bound with strings to the rod so that the pouch may stay swinging in the liquid. Then the vessel is subjected for slow heating. This apparatus is known as Dola yantra i.e. swing apparatus. (Rasaratnasamuchchaya)

Use- Dola Yantra is used for Swedana of Parada, it is also used in Shodhana of Dhattura Bija, Jayapal Bija Vatsnabha purification and Haratala Shodhana.

Valuka Yantra



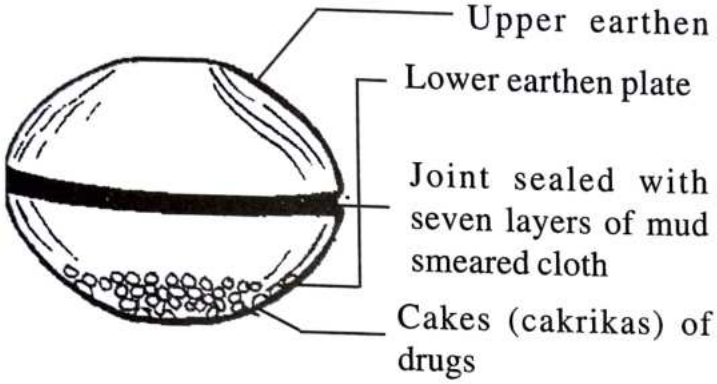
सरसां गूढवक्त्रां मृद्वस्त्राङ्गुलघनावृताम्।
शोषितां काचकलशीं त्रिषु भागेषु पूरयेत्॥
भाण्डे वितस्तिगम्भीरे वालुकासु प्रतिष्ठिताम्।
तद्भाण्डं पुरयेत्त्रिभिरन्याभिरवगुण्ठयेत्॥
भाण्डवक्त्रं मणिकया सन्धिं लिम्पेन्मृदा पचेत्।
चुल्ल्यां तृणस्य चादाहान्मणिकापृष्ठवर्तिनः।
एतद्धि वालुकायन्त्रं तद्यन्त्रं लवणाश्रयम्॥
पंचाढवालुकापूर्णभाण्डे निक्षिप्य यत्नतः।
पच्यते रसगोलाद्यं बालुकायन्त्रमीरितम्॥
(R.R.S. 9/36-39)

- In this Yantra for preparation of Aushadhi Kanch Kupi is needed to which cloth smeared with mud having thickness of one Angula is wrapped and dried well.
- The Kajjali is filled up to 2/3 portion of this Kanch Kupi.
- An earthen pot having depth of one Vitasti is taken so that Kupi could be placed into it and sand can be filled in the space left.
- The amount of sand should be 5 Aadhaka and it is filled in such manner so that the neck portion is opened or 2/3rd portion of Kupi is occupied by sand and one fourth upper part of earthen pot should be empty.
- The mouth of earthen pot should be closed with a Sharava by using Sandhi Bandhan.
- Heat is applied in Mridu, Madhya and Tivra

Agni Krama till the dry grass is burnt when it is placed the back of Sharava.

Use- It is used specially for the preparation of Kupi Pakwa Rasa e.g. Rasa Sindura, Makaradhwaja, Malla Sindura etc. If salt is used in place of Valuka, then it is called Lavana Yantra.

Puta Yantra



शरावसम्पुटान्तःस्थं करीषेष्वग्निमानवित् ।
पचेच्चुल्यां द्वियामं वा रसं तत्पुटयन्त्रकम् ॥
(र.र.स.9/42)

When Rasa etc is mixed with another drug or herb and then it is kept in Sharava Samputa. Now Sharava Samputa is subjected to the proper heat of Karisha coal for two Yama. It is known as Puta Yantra. This is used in incineration of Loha etc.

Khalwa Yantra

खल्व यन्त्र त्रिधा प्रोक्तं रसादि सुखमर्दने ।
(R.R.S 9/81)

Khalva Yantra is of three types. It is used for easy trituration (Mardan) of Parada etc.

Three types of Khalva Yantra is as follows :

- Ardha Chandrakara
- Vartula
- Tapta

Rasa Tarangini has described Vartula and Droni types of Khalvayantra.

Material for the preparation of Khalva Yantra

खल्ल योग्या शिला नीला श्यामा स्निग्धा दृढ़ा गुरुः ।
(R.R.S. 9/78)

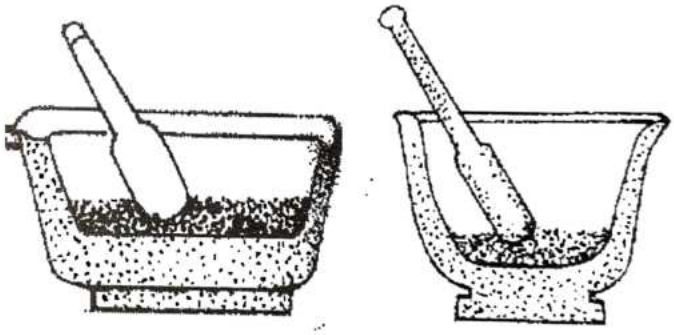
Stone which is Nila (Bluish) or Shyam (Black) coloured smooth, strong and heavy is best to build Khalva Yantra.

Rasarnava has described the following material to prepare Khalva Yantra.

मृन्मये लोह पाषाणे ह्यस्कान्तमयेऽथवा ।
क्वचिन्तु पाषाणे स्फटिके वाऽथ मुक्ताशैलमयेऽथवा ॥
(Rasar. 4/49)

Khalva Yantra can be prepared by Loha, Pashana, Ayaskant, Sphatika or Muktashaila.

Ardha Chandrakara Khalva



उत्सेधे स दशाङ्गुलः खलु कलातुल्याङ्गुलायामवान् ।
विस्तारेण दशाङ्गुलो मुनिमितैनिम्नस्तथैवाङ्गुलैः॥
पाल्यां द्व्यङ्गुलविस्तरश्च मसृणोऽतीवार्द्धचन्द्रोपमो ।
घर्षो द्वादशकाङ्गुलश्च तदयं खल्लो मतः सिद्धये ॥
(R.R.S 9/83)

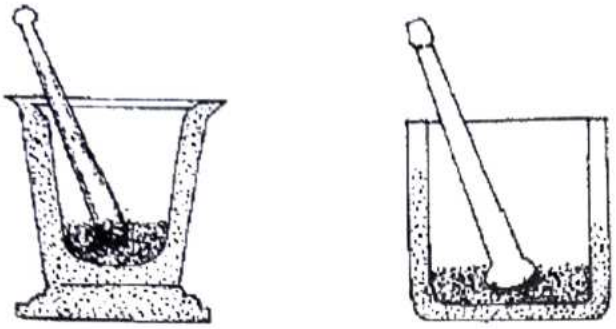
This type of Khalva is made into Ardha Chandrakara (Semi lunar) in shape. Now a days Ardha Chandrakara Khalva made up of Lauha are also available.

Use-

अस्मिनपञ्चपलः सूतो मर्दनीयो विशुद्धये ।
तत्तदौचित्ययोगेन खल्लेष्वन्येषु योजयेत ॥
(R.R.S. 9/84)

The above dimensioned Khalva Yantra is used for Mardana of five Pala Parada. According to use it can be prepared of varying dimensions.

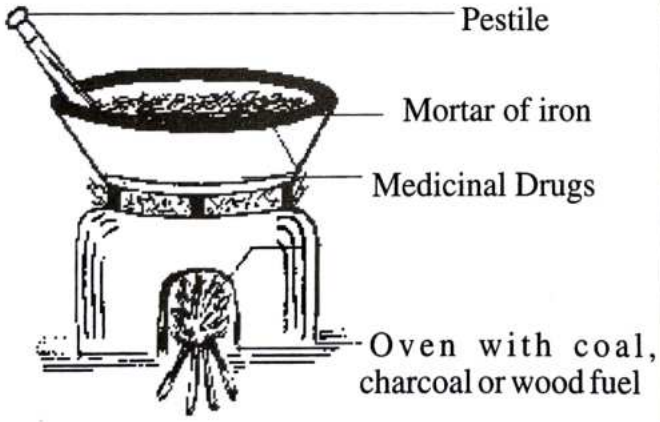
Vartula Khalva



द्वादशाङ्गुलविस्तारः खल्लोऽतिमसृणोपलः ।
चतुरङ्गुलनिम्नश्च मध्येऽतिमसृणीकृतः ॥
मर्दकश्चिपिटोऽधस्तात्सुग्राहश्च शिखोपरि ।
अयं तु वर्तुलः खल्लो मर्दनेऽतिसुखप्रदः ॥
(R.R.S. 9/85-86)

This Khalva is having circumference of 12 Angula and depth of 4 Angula. It should be very smooth in centre. Its pestle should flatten at the edges. Its upper portion should be designed very well so that it is gripped well. This is Vartula Khalva used for easy Mardan.

Tapta Khalva



लौहो नवाङ्गुलः खल्लो निम्नत्वे च षडङ्गुलः ।
मर्दकोऽष्टाङ्गुलश्चैव तप्तखल्लाभिधोऽप्ययम् ॥
(R.R.S. 9/87)

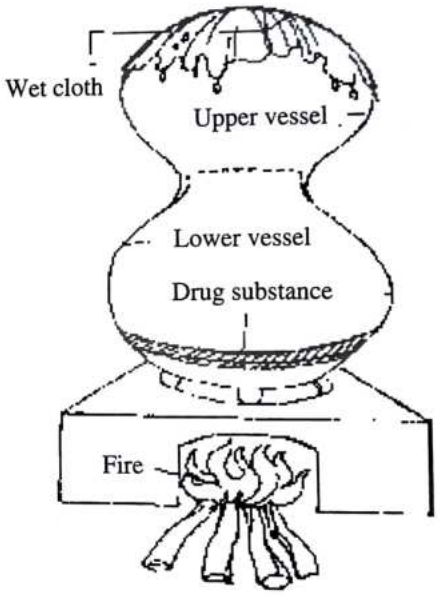
Tapta Khalva has following specification. It has circumference of 9 Angula and depth of 6 Angula. It's pestle is 8 Angula in length. It is made up of Lauha.

Method for use

कृत्वा खल्लाकृतिं चुल्लीमङ्गारैः परिपूरिताम् ।
तस्यां निवेश्य तं खल्लं पार्श्वे भस्त्रिकया धमेत् ॥
तदन्तर्मर्दिता पिष्टिः क्षारैरम्लैश्च संयुता ।
प्रद्रवत्यतिवेगेन स्वेदिता नात्र संशयः ॥
(R.R.S. 9/88-89)

Chullika (Hearth) is made to the size of Khalva Yantra then it is filled with coal fire after that Khalva is placed over it and it is blown by Bhrastrika from side for proper burning of coal fire. The Pishti which is triturated into it by mixing Kshara and Amal Dravya is become Svedita very soon.

Patana Yantra



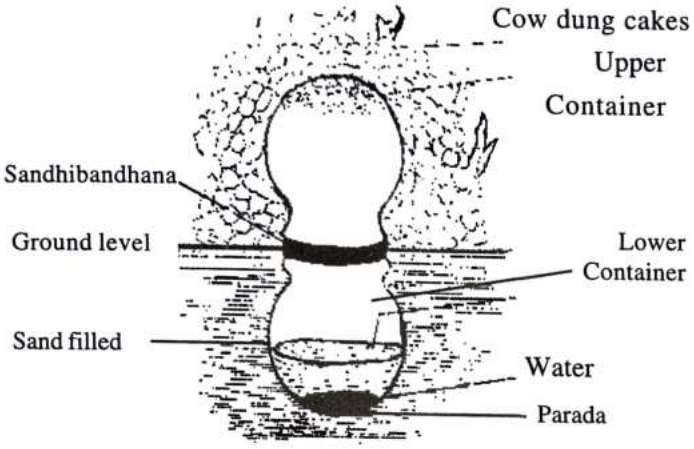
अष्टाङ्गुलपरीणाहमानाहेन दशाङ्गुलम् ।
चतुरङ्गुलकोत्सेधं तोयाधारं गलादधः ॥
अधोभाण्डमुखं तस्य भाण्डस्योपरि वर्तिनः ।
षोडशाङ्गुलविस्तीर्णपृष्ठस्यास्ये प्रवेशयेत् ॥
पार्श्वयोर्महिषीक्षीरचूर्णमण्डूरफाणितैः ।
लिप्त्वा विशोषयेत्सन्धिं जलाधारे जलं क्षिपेत् ॥
चुल्यामारोपयेदेतत्पातनायन्त्रमुच्यते ॥
(R.R.S. 9/6-8)

An earthen vessel having its base of 16 Angula breadth is taken and a Toyadhara having dimensions of length 10 Angula, breadth 8 Angula and height of 4 Angula is made. Now another earthen pot is taken and mouth of upper vessel containing Toyadhara entered to lower vessel and junction of both vessel is sealed by paste of Mandoor powder, Phanita and Mahisha milk. Jaladhar is filled with water and the heat is provided

to this apparatus by putting it on Chullika. This Yantra is known as Urdhva Patana Yantra.

Use- Urdhva Patana of Parada. Here in this Yantra Parada kept into lower vessel and get sublimated to upper vessel.

Adhah Patana Yantra

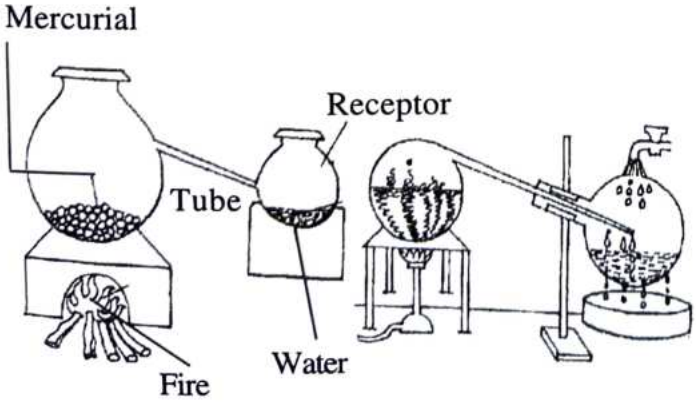


अथोर्ध्वभाजने लिप्तस्थापितस्य जले सुधीः।
दीप्तैर्वनोपलैः कुर्यादधःपातं प्रयत्नतः॥
(R.R.S. 9/9)

Two earthen pots are taken and water is filled in lower vessel while Parada and herbal Kalka paste is smeared to bottom of another vessel. After that mouth of both vessel is conjunct and sealed securely by applying specific paste or cloth smeared with Mud. It is kept into a dig and upper vessel is covered by Upla and heat is given. This type of apparatus is known as Adha Patana yantra. In this yantra Parada moves to downward.

Use- Adha Patana of Parada.

Tiryaka Patana Yantra



क्षिपेद्रसं घटे दीर्घनताधोनालसंयुते।
तन्नालं निक्षिपेदन्यघटकुक्ष्यन्तरे खलु॥
तत्र रुद्ध्वा मृदा सम्यग्वदने घटयोरथ।
अधस्ताद्रसकुम्भस्य ज्वालयेत्तीव्रपावकम्॥
इतरस्मिन्घटे तोयं प्रक्षिपेत्स्वादु शीतलम्।
तिर्यक्पातनमेतद्धि वार्तिकैरभिधीयते॥
(R.R.S. 9/47-49)

An earthen pot is taken and a hole is made near to its neck and pipe is fitted to it by means of mud. The other end of this pipe to fitted to body of other vessel in transverse state. The first vessel contains Parada with Patana drugs and heat is applied to it while the other vessel contains water. The mouth of both pot is covered by means of Sharava. When heat is applied Parada is get collected into the water containing pot as a result of condensation.

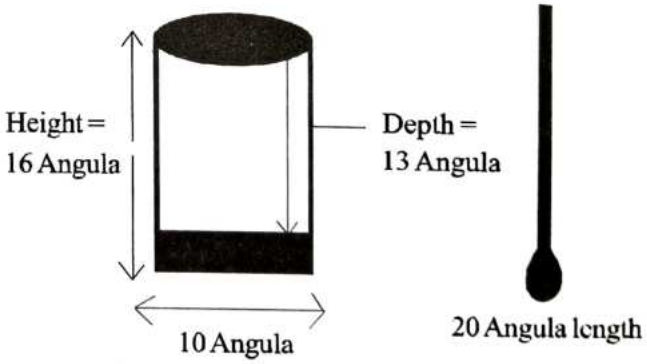
Use- Tiryaka Patana of Parada

Darvika Yantra

चषकं दर्विकाकल्पदीर्घ हस्तक संयुतम्।
दर्विकायन्त्रमेतद्धिगन्धशोधन साधकम्॥
(R.T. 4/39)

When a bowl is joined to a rod having its length as one hasta. This is known as Darvika yantra and it is used for Gandhaka Shodhana.

Ulukhala Yantra

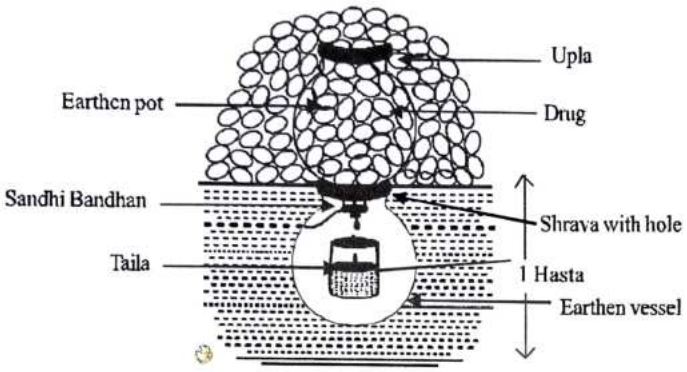


दशांगुलन्तु विस्तारे तूत्सेधे षोडशांगुलम्।
त्रयोदशांगुलं चैव निम्नत्वेन च संदृढम्॥
अयसा निर्मितश्चैव मध्येऽतिमसृणीकृतम्।
विंशत्यंगुलदीर्घश्च लोहदण्डः सुशोभनः॥
उलूखलाभिधं यन्त्रं बुधैरेतत्प्रकीर्तितम्।
ताप्यादीनां कुट्टनार्थं यन्त्रमेतत्प्रकीर्तितम्॥
(R.T. 4/58-60)

It is used in trituration. It usually is made of wood or iron. It is also called Kuttanaka Khalwa. Loha Ulukhala yantra having length 16 Angula, width 12 Angula, Inner depth 13 Angula and mortar 20 Angula made of iron.

Use- To pound minerals and herbs.

Patala Yantra



Patala Yantra

भूमौ हस्तमितं निम्नं विदध्याद् गर्त्तमुत्तमम्।
तस्मिन् पातं निधायाथ तद्रूपं पात्रमन्यकम्॥
आददीत ततस्तस्मिन्नौषधाग्नि निधापयेत्।
आस्यमस्य शरावेण छिद्रगर्भेण रोधयेत्॥
पात्रमेतत्तु गर्तस्थे पात्रे यत्नेन विन्यसेत्।
विदध्यादनयोर्यत्नात् सुदृढ़ सन्धिबन्धनम्॥
मृदा सम्पूर्यं गर्तन्तु बह्निं दद्यात् प्रयोगवित्।
स्वांगशीतं ततो ज्ञात्वा रस तन्त्र विचक्षणः॥
उपस्थिन्तु वै पात्रं शनैः समवतारयेत्।
अधःपात्र गतं तैलं गृह्णीयात्तु विधानतः॥
एतद् बुधैः समाख्यातं यन्त्रं पातालसंज्ञाकम्।
आहर्तुं गन्धकादीनां तैलमेत्प्रयुज्यते॥

(R.T. 4/47-52)

A dig having depth of one Hasta (45.72 cm) is made inside earth. After that a vessel which can be fitted into dig is taken and the drug, of which Taila is to be obtained, is filled into another vessel and this vessel is closed with Sharava having a hole in its centre. Now the vessel which contains the drug is kept downwards to first vessel. The upper vessel is covered with Uplas according to nature of drug from which Taila is to be obtained. Now Uplas are burnt and Taila is collected to lower vessel. Taila is collected after self-cooling of the vessel.

Use- To obtain the Gandhaka Taila. By this Yantra Bhallataka Taila etc. can be obtained.

Kupi Yantra

काचताम्र युता कूपी दृढा रम्याकृतिस्तथा।
प्रलिप्य तूलमृत्स्नाभ्यां लेप्या शोष्या पुनः पुनः॥
इत्थं तु संस्कृता कूपी तत्र सत प्रतिशयेत्।
तन्मुखं मुद्रितं कृत्वा यन्त्रे सिकताभिधे पचेत॥
अथवा पाटले यन्त्रे यन्त्रे वाट्युभयात्मके।
कूपीयन्त्रं समुद्दिष्टं तदशोक गुणावहम्॥

(Parada Samhita)

Kanch and Tamra is mixed properly. From this material Kupi is made having long neck. Now this Kupi is wrapped with cotton cloth smeared with Multani Mitti. When it is dried then next layer is smeared with Multani Mitti and the process is repeated for seven times. Now Parada and other drug is kept inside this Kupi and heating is done by means of Baluka or Lavana Yantra. It is known as Kupi Yantra.

Arkapatana Yantra

In the Ayurvedic Formulary of India it is termed as Distillation Apparatus. It has three parts-

1. Distillation Flask
2. Condenser.
3. Collection Vessel.

1. Distillation Flask - Aushadhi Dravya and water are kept inside it and heating process is done.
2. Condenser - It condense the vapour which are produced as a Distillation result of heating of the liquid in the Distillation flask.

3. Collection vessel - when vapours are condensed then these converted into liquid form. This liquid is collected in this vessel which comes from condenser drop by drop.

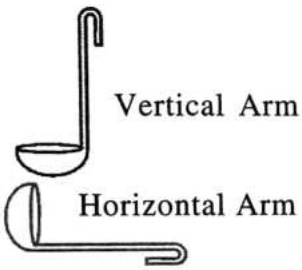
Use-Prepare different Arka Kalpana like Puspa Arka, Sattu Dhanya Arka, Kshiri Vriksha Arka, Visha Varga Arka etc.

Pithara Yantra

A small cylindrical shaped vessel which is closed at one end and open at other end. The open is fixed with a suitable plate having a hole in its center. It is known a Pithar Yantra. It is used for the Shodhana of Naga, Vanga and Yashada.

- Sharava Yantra
- Earthen pot having disc shaped structure is known as Sharava.

Palika Yantra

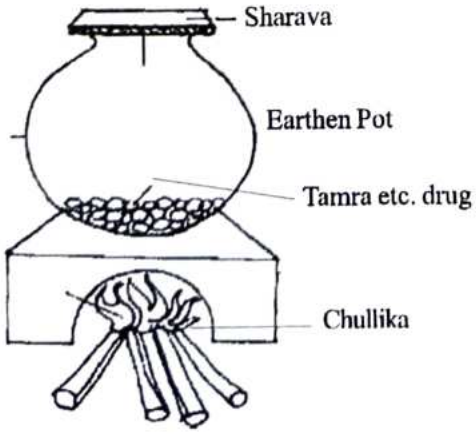


चषकं वर्तुलं लोह विनताग्रोर्ध्वदण्डकम् ।
एतद्धि पालिकायन्त्रं बलिजारणहेतवे ॥
(R.R.S.9/50)

A circular bowl made up of Louha is fixed with straight rod having its other end blended. This Yantra is known as Palika Yantra.

Use- For the Jarana of Gandhaka.

Sthali Yantra

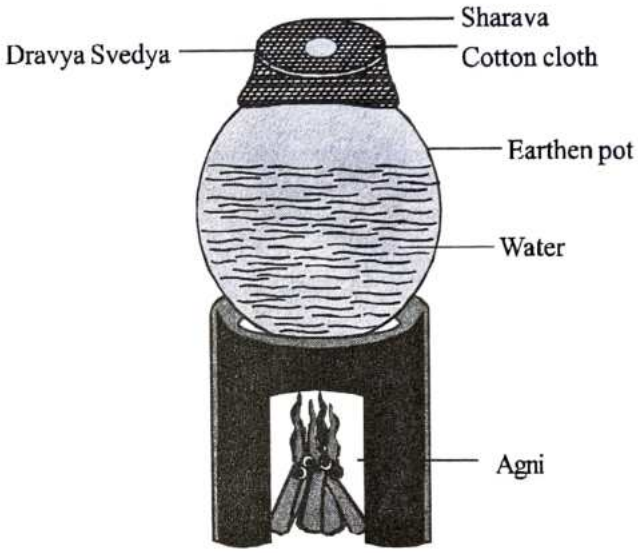


स्थाल्यां ताम्रादि निक्षिप्य मल्लेनाऽऽस्यं निरुद्धम च ।
पच्यते स्थालिकाधस्तात्स्थाली यन्त्रमिदं स्मृतम् ॥
(R.R.S.9/67)

Tamra etc. are kept with required drugs into an earthen pot and its mouth is sealed with Sharava and heat is given. It is known as Sthali yantra.

Use- For the Paka of Tamra, Shankha etc.

Swedana Yantra

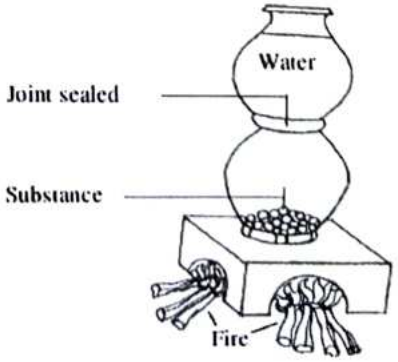


स्थूल स्थाल्यां जलं क्षिप्त्वा वासो बद्ध्वा मुखे दृढम् ।
तत्र स्वेद्यं विनिक्षिप्य तन्मुखं प्रपिधाय च ॥
अधस्ताज्ज्वालयेदग्निं यन्त्रं तत्कन्दुकाभिधम् ।
स्वेदनीयन्त्रमित्यन्ये प्राहुश्चेदं मनीषिणः ॥
(R.R.S.9/75-76)

Liquid is filled into a big earthen pot then its mouth is covered with cloth. Svedya Dravya is kept on this cloth and it is covered with Sharava and heat is given. This Yantra is known as Swedana Yantra.

Use- For Swedana purpose.

Vidyadhara Yantra



यन्त्रं विद्याधरं ज्ञेयं स्थालीद्वितयसम्पुटात्।
चुल्लीं चतुर्मुखीं कृत्वा यन्त्रभाण्डं निवेशयेत्॥
तत्रौषधं विनिक्षिप्य निरुन्ध्याद्भाण्डकाननम्।
यन्त्रं विद्याधरं नाम तन्त्रज्ञैः परिकीर्त्तितम्॥
(R.R.S.9/27-28)

When the bottom of one earthen pot is sealed securely with the mouth of another earthen pot and this system is heated by fire from all four direction. In this Yantra the drug is kept in lower pot. This system is known as Vidyadhar Yantra.

Use- Sublimation of Parada

Modern Machinery

Grinder

Principal- It works on principal of crushing

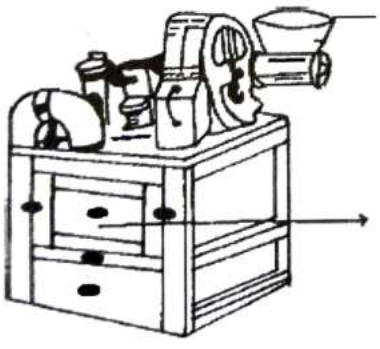
Construction-It has three main parts

- Hooper or feeding main parts
- Chamber
- Bag for collection

Working- Drug is sent to milling or central chamber by hooper. Where it is crushed resulting into size reduction of drug. After size reduction powdered drug is collected into bag. It operates by electricity with the help of motor.

Use- For manufacturing of powder.

Disintegrator



Disintegrator mill is used for size reduction. It is used for manufacturing powder/Yavakuta Churna.

Principal- It works on principal of impact.

Construction-It has three main parts

- Hooper or feeding parts
- Central shaft
- Collection chamber

Hooper or feeding device- By hooper drug is sent to central shaft for size reduction.

Central shaft- It has drum like structure to which a disc is attached. Stationary beaters are fixed to disc and these are four in numbers. This disc rotates very fast. The upper part of shaft is attached to hooper and sieve is attached to its lower part which can be changed according to need for obtaining a particular sized drug.

Collection chamber- The milled materials is collected into this chamber sometimes a dust Vag is also attached to it for collecting drug.

Working- The drug which is to be milled is sent into central shaft through hooper where drug is hit by fast moving beaters. It results into size reduction of drug. After sieving the drug is collected into dust bag.

Use-

- For making fine powder of all types of hard drugs.
- They are used for powdering crude vegetable drugs.
- They can be used for milling the ointments and for mixing the powdered ingredients.

Pulverizer

The term pulvis means powder and pulverization is the process of size reduction. The instruments used for the preparation of powder are known as Pulverizer. In these types of machines, the size reduction takes place an following principle-

1. Impact
2. Attrition.
3. Crushing.

According to speed these can be of three types-

1. Low Speed - e.g.- Ball mill
2. Medium Speed -e.g. Ring and Ball mill
3. High Speed- Attrition Mill

Working - Dried raw drugs are send into crushing chamber through Hooper. The crushing chamber contains hammer which can move very fast. The moving hammers provide impact/attrition to the raw drugs resulting into size reduction of the drugs. Powder of the drug is collected into collecting chambers.

Use- Pulverizers are used to prepare fine powder.

Powder Mixer

Mixing is a process through which randomization of dissimilar particles within a system takes place. Spatulation, Trituration, Tumbling etc. are some mixing operations. Mixing process is done in the manufacturing of various Kalpanas. Mixing can be of solid mixing or liquid mixing type. Various mixing equipments like Tumblers, Twin Shell blender (V cone blender), Double con blender, Tumbling blender with agitator mixing blade, Sigma blade mixer etc. are used.

Construction- It is a container like structure which can be of various geometrical shapes. It is constructed that it can rotates on its axis.

Working- Materials which are to be mixed are kept inside through an opening after fillings of material it is closed through a lid. The cylinder rotates on its axis resulting into proper mixing of material.

Agitator mixer- These types of mixers are trough type in which an arm rotates and mixing takes place through shearing action.

Tumbling mixer- In these types of mixers, mixing takes place through rotation. These are cylindrical type and moves on its horizontal axis. In other types cylinder rotating about its mid-point on an axis right angle to the longitudinal axis, a cube rotating about a diagonal and double cone, V-shaped, Y-shaped together with baffles. These shapes provide three-dimensional movement and mixing process takes place.

Mechanical shifter

Mechanical Shifters are used to separate the size of granules or powders through the desired porosity of mesh not. The basic technique involved is passing the particles through a series of sieve of uniform size. Size separation takes place by three methods.

1. Agitation
2. Brushing
3. Centrifugal force.

Agitation Method - Sieves are agitated in a number of ways. Some are as follows-

a) Oscillation- The sieve is mounted in a frame so that it oscillates froth and back. The motion is parallel to the plane of the sieve. The reciprocating motion is induced by an ordinary eccentric on a rotating shaft.

b) Vibration - In this method sieves vibrate with at high speed by means of eccentric device. By means of vibration powder passes through the sieve.

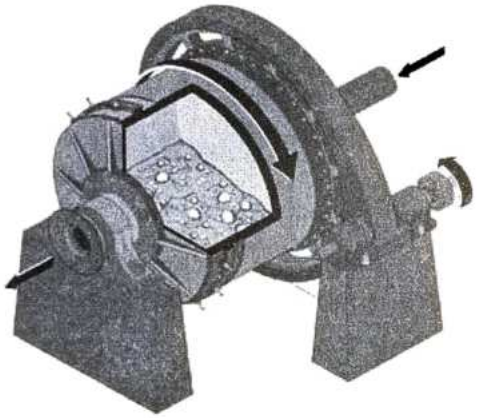
c) Gyration - In this method sieve is on rubber mounting and connected to an eccentric flywheel. It provides a rotary movement of

small amplitude to the sieve, resulting into spinning motion to the particles that helps to pass them through the Sieve.

Brushing Method - In this method a brush is used to move the particle on the surface of sieve and to keep the mesh clear. This is used for the size separation of sticky powders.

Centrifuge Method - In this method particles are thrown outwards by centrifugal force which is generated by a high-speed rotor which is fixed inside a vertical cylindrical sieve. This method is useful for fine powder.

Ball Mill



Principle - Ball mill works on the principle of impact which is in between the moving balls and powder materials. Ball and material both are kept in a closed hollow cylinder. This cylinder rotates on its longitudinal axis by which impact is produced between powder material and ball.

Structure - Ball mill consists of hollow cylinder which is fixed on a frame in such a way that it can rotate on its longitudinal axis. The volume of cylinder is way that it can occupied upto 30 to 50% by the balls. The balls are different size and are solid having weight.

Working - During the rotation of cylinder impacts works between balls and powdering material resulting into the size reduction. Ball millworks on the electricity.

Granulator

It is used to prepare granules. Granules can be made by dry granulation or wet granulation process. Shear granulator, under which planetary mixer and oscillating granulator comes is used for wet granulation. High speed granulator includes Gral mixer granulator, Fluoridized Bed granulator etc. Here Oscillating Granulator is described.

Structure- It can be divided into three parts-

1. Hooper- Material of which granule is to be made is send inside.
2. Central part- It is attached with Rotor with blade and sieve is attached to its lower part. Rotor oscillates on its horizontal axis.
3. Collection chamber- Here granules are collected.

Working-Granulation material is sent to central part through hooper which comes in contact with Rotar blades resulting into small size granules. These comes to collections chamber after passing through sieve.

Dryer

Dryers are used in the pharmacies for the drying of materials which are having different nature. The dryer can be of following types-

1. Static Bed Bryer - As the name indicates that there is no relative movement among the solid particles being dried, however there may be bulk motion of entire drying mass. Tray dryer and freeze comes in this category.

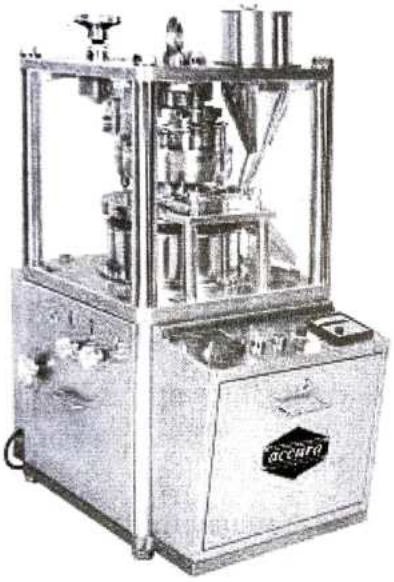
2. Moving Bed Dryer - Drum dryer comes in

this category where drying particles are partially separated so that they flow over each other.

3. Pneumatic Dryer - Spray dryer comes in this category where drying particle are entrained and conveyed at a high velocity gas stream.

4. Fluidized Bed Dryer - It's example is Fluidized Bed Dryer in which the solid particles are partially suspended in an upward moving heated gas system.

Tablet compressing machine



Tablet machine can be two types-

1. Hand operated- Initially this type of machine was used.

2. Automated machine- Now a days automatic machine are used. One of these is Rotary type tablet machine from which a large number of tablets can be made in short time.

Hand Tablet Machine- It has three main parts-

- **Wheel-**To which hooper on the upper portion and shoe on its lower part, through a rod which can move, is a attached.
- **Punch-** There are two punches with upper punch the process of compression takes places. While lower punch is used to adjust the volume of die, according to size of tablet is adjusted.
- **Die-** In the die granules are filled through shoe and due to compression by punch tablet is prepared.

Working

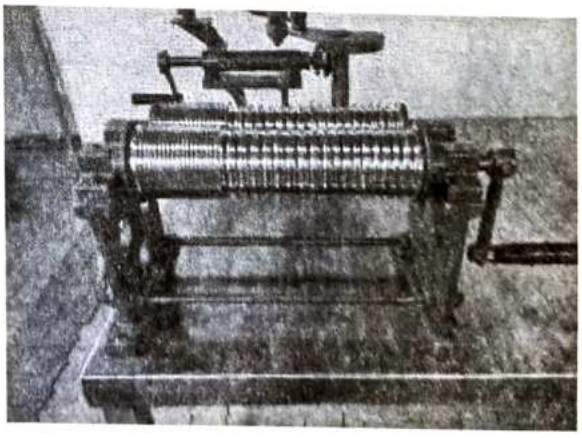
1. Hooper is filled with granules. These granules are directed to die through shoe.
2. When wheel rotates the shoe moves slowly towards die and granules are filled into die.
3. In the next stage shoe moves backward at the same time upper punch moves downwards towards die. This process results into compression of granules resulting into shape of tablet.
4. Now as wheels moves upper punch moves upward as well as lower punch also moves upwards. It results to coming out of tablet from die.
5. In next stage shoe which is towards its backside again moves forward and prepared tablet pushes towards forward and collected at the same time granules are filled into die.

Rotary Type Tablet Machine

It is composed of a circular rotating head to which many punches and dies are assembled. It has three sections.

1. Upper part- To which upper punch is fixed.
2. Central part- Dies are attached.
3. Lower part- To these lower punches are attached

Pills making machine



It is used for making of pills like Guggulu etc. Pills can be made in two steps i.e. preparation of stick and then cutting of these sticks to form pills. It can be done by two machines.

1. Stick making machine
2. Stick cutting machine

Stick making machine

Structure- It includes a hollow cylinder which is fixed on a frame. On the one end of this cylinder there is a plate having apertures and it can be open through screw the other end there is a piston which can move by screw.

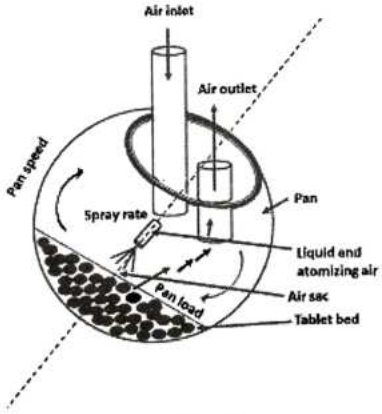
Working- Piston is opened and doughy mass of drug is filled into it then it is tied with help of screw as a result dry comes out in the form of stick through aperture of plate.

Stick cutting machine

Structure- It is composed of two roller which can move in same direction. Surface of both roller have grooves.

Working- Stick is put in between grooves and roller is rotated. It results into cutting of stick into similar sized Vati.

Coating and Polishing pan



Construction- Coating pan is tilted copper pan which is tilted on its axis at 400 angle and rotates on its axis with help of motor. Polishing pan is made up of Canvas drum which is used on the same machine by removing coating pan. This pan contains air blowers through which hot air comes out. Beside it exhaust pipe is also fitted to remove excess dusting powder and moisture.

Working- The tablets which are to be coated are kept inside this pan. Now coating material is sprayed on these tablets and pan is rotated. It results into coating of sprayed material on tablets. After that hot air is blown drying of coated material.

End Runner Machine

Principal- It works on compression which is given by pestle made up of heavy stone.

Construction- End runner has a mortar which may be made up of steel or stone and its bottom is fixed on a plate very well. A cogwheel with pully is attached to this plate so that it can move very fast. Its pestle is attached by hinge so that it can taken out for cleaning and material can be taken out from mortar.

Working- In the working condition mortar and pestle move very fast. The drug of whom size is to be reduced or Bhawana is to be given is put into mortar. Due to movement its size is reduced or Bhawana is given. Mortar is attached with iron foil which direct the drug in front of mortar.

Uses- It is used for size reduction of Kasisa, Gairika etc. and for Bhawana.

Edge runner machine

Principal- Edge runner mill works on principal of compression which is given by heavy wheels.

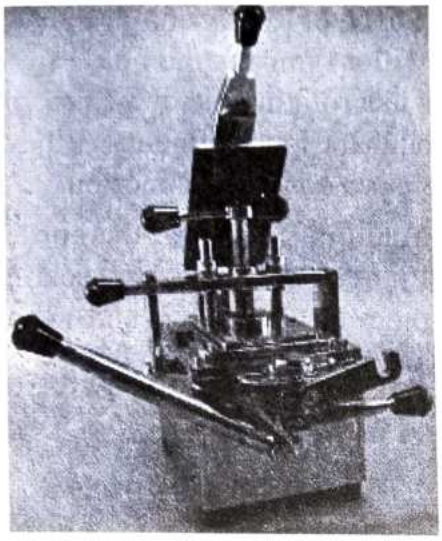
Construction- It contains a tub like structure made up of steel and acts as mortar. In this tub there are two heavy wheels made up of iron and are connected with each other through an iron red. These wheels move on their axis as well as on the base of tub also. It works on electricity and movement is given by motor.

Working- The drug which is to be grinded or levigated is put into tub, with the movement of wheels size reduction or levigation takes place. Scrapper directs to the drug in front of wheel.

Uses- For levigation as well as size reduction of Raas Dravya.

Capsule filling machine

Now-a-days various types of capsule filling machine are available that can be used according to necessity. Capsule filling machine can be of hand operated or electrically operated. Fully



automatic capsule filling machine is used for the filling of capsule at large scale. Hand operated capsule filling machine are used at small scale. For filling in this type hard gelatine capsules are used.

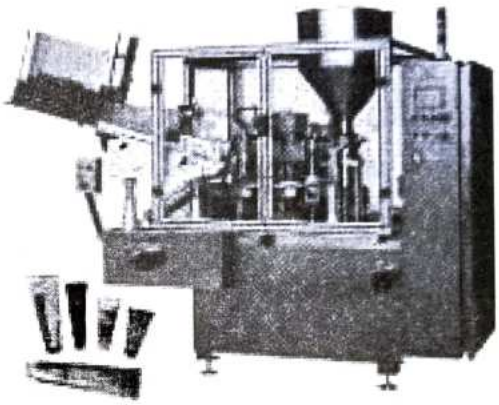
Construction- Hand operated capsule filling machine are made of steel. It contains a tray which is at over die. For filling Churna into die a dispenser and scoop is present. Another plate containing pin is also present for pressing.

Ointment mixer

Planetary mixers are used for the preparation of ointment. Planetary mixers consist of a vertical cylindrical shell which can be removed either by lowering it beneath the blade or raising the blade above the bowl. Mixing blade is mounted from the top of the bowl and mixing shaft is driven by a planetary gear train so that it can rotate around ring gear.

Working - Agitator has a planetary motion in the type of mixer. It rotates around the central axis as well as to own axis. Blade is shaped to pass with close clear clearance over the side and bottom of the mixing bowl. Due to variable Speed, initially the blade moves slowly for promising and finally at increased speed for active mixing.

Tube filling machine



Tube Filling Machine can be of two types -

1. Automatic Tube Filling Machine
2. Semi-automatic Tube Filling Machine

Automatic Tube filling machine consists of following parts which works simultaneously

1. Hooper - It is a funnel like structure which directs the filling material towards inside.
2. Filling Nozzles - through it material is guarded towards tube in a calculated amount.
3. Discharge Unit - It fills the product material inside the tube.
4. Tube Holders - These hold the hollow tubes and guarded.
5. Tank - It stored the product which is being filled. There is sealing with also which seals the tube after filling of material.

Sieves & Meshes

Sieve are used for size separation. After size reduction the obtained powdered is mixture of different sized powders. It is separated by using sieve.

Structure- A specific sieve has specific sized openings. These mesh or openings are made up to

wire or perforated plate. For making of wire the following materials like iron, coated iron, copper, copper alloys and stainless steel are used. Besides these non metals are also used for construction of mesh.

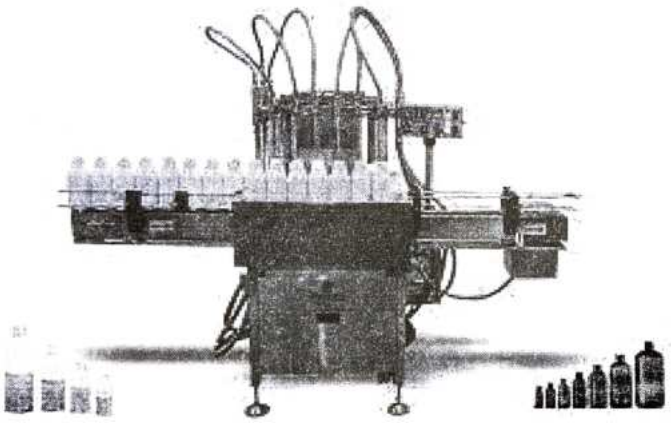
Types of mesh- It can be of two types-

1. Wire type
2. Perforated plate type

Sieving methods- These can be of following types.

1. Mechanical method
2. Sedimentation method
3. Elutriation method

Liquid Filling Machine



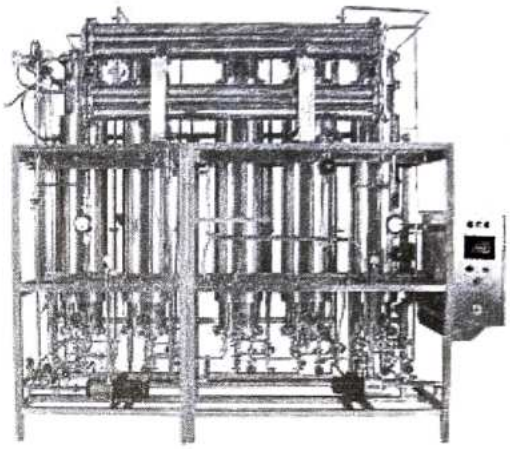
Liquid filling machines expedite the manufacturing of liquid drug suspense ions. It dispenses the exact amount of liquid product into different containers such as bottles, cans, cups, cartoon etc. as per need. These can be of manual, semi-automatic or fully automatic. Liquid filling machine liquid from a large container or tank, a harper and deliver a fixed quantity of liquid into bottles or other contain via a nozzle. Most liquid products are filled by one or two major methods that are-

- Volumetric-Each container is filled accurately. It is of three types-Piston operation, diaphragm action and timed flow.
- Constant level filling-to be filled act the same level.

Fillers can be of Rotary and straight-line types. The rotary filler removes the bottle from convey or onto due to a rotating plat which carries then in a circle through the is a continuous as they are filled sot that there is a continuous motion.

When liquid is filled into the bottle or other container it moves forward where sealing is done after that there are collected and are ready for transportation.

Distillation Plant



Generally, distillation plant consists of following three parts :

1. Still
2. Condenser
3. Receiver

1. Still - It is the vaporing chamber and the material, of which distillation is to be done, is placed here. Half or two third part of the still is filled water or liquid. Still is heated with suitable heating device. At the lab scale round bottom flask, made up of glass is used so that the distillation process can be seen. Besides of glass still is also made from stainless steel, copper etc. Vapours are generated in this chamber.

2. Condenser- The vapors which are generated pass through the condenser and these are condensed here. It is kept cool through the circulation of water. Circulation system is attached over it. Boiling point and volatility are two main factors while selecting the condenser. It is connected with receiver through adapter. The

position of Condenser is oblique or upright. Condenser can be of three types -

a) Single surface condenser

b) Double surface condenser.

c) Multi tubular condenser.

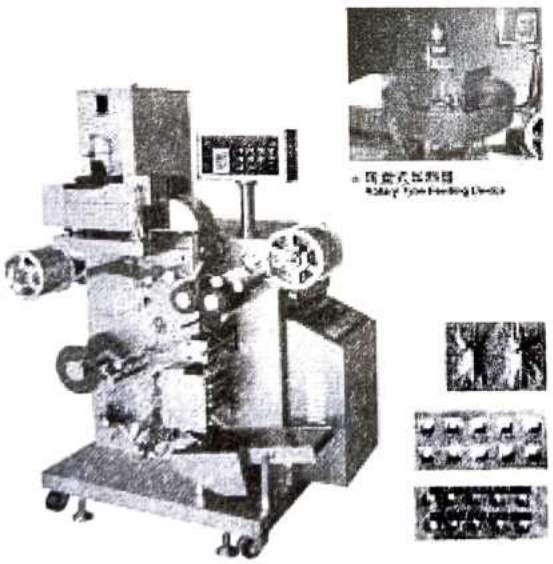
Receiver- Distillates are collected here. Receiver looks like flash or modified flask example Florentine receiver. This type of receiver is used to separate the and water and are following two types -

Type I - used for separation of oil heavier than water,

Type II - used for separation of oil lighter than water.

Type I contains two taps. From the upper tap water overflows while oil is collected from bottom tap. Type II contains siphon at the bottom which works after filling of water while oil flows through the upper tap.

Strip packing machine



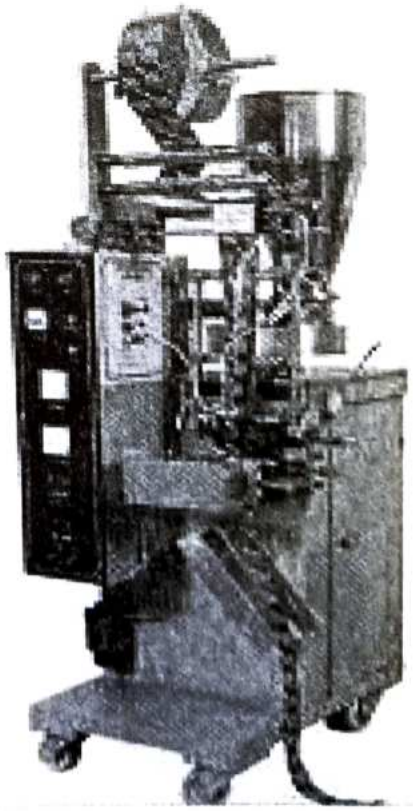
Now a days Automatic Strip Packing Machines are available which pack the tablets or capsules in the strip form in very less time. These types of machines are fully automatic and perform the processes like feeding sealing. Slitting and cutting simultaneously, one after another. These machines are skilled for the packing in the different size and shape.

These machines are consisting of following parts-

- Vibrator
- Chute
- Sealing Roller
- Slitting
- Draw Brushes
- Cutter

Working - Tablets, capsules which are to packed in strip form are filled in the hooper. From here these move forward for being packed into strip. Foils are needed for their conversion into strip. These foils are rolled in a holder from where they move over a heated roller which has cavity. This cavity decides the shape of strip and it can be changed according to size of sublets or capsules. When foil moves over this roller the cavity is form accordingly. In the next stage tablets comes from hooper and are fitted in to these cavities. On moving forward the other surface of tablet containing strip is sealed. After sealing there are cut by the cutter according to need.

Pouch Filling Machine



Pouch Filling Machines can be of two types-

1 Vertical Form Fill seal [VFFS]

2. Horizontal Form Fill Seal [HFFS]

Vertical Form Fill seal machines are more convenient and are widely used for pouch filling . These machines consist of following parts -

1. Film Pulling system.
2. Pouch Former
3. Filling and Sealing Machine
4. Pouch cut
5. Control Cabinet.

Film Pulling system - It consists of a roller and tensioner. Film rolls like PET, aluminum foil etc. are rolled over roller. Tensioner opens the foil and directs it towards the system.

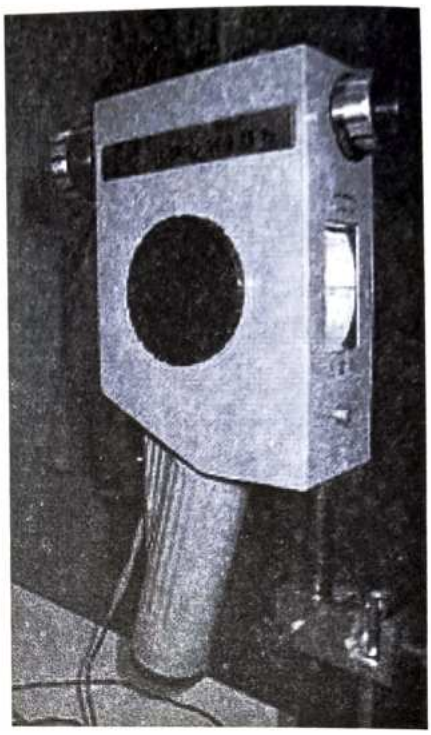
Pouch Former - When foil reaches to this system then it is shaped into pouch form by means of sealing Jow.

Filling and Sealing Machine- When pouch reaches in this chamber it is filled with calculated amount of product material and is sealed in next sequence. Volumetric fillers are used for the filling of uniform amount of the product.

Pouch Cut - In the next consequence the pouch is cut into definite size, and it is directed towards collection system where pouches are collected.

Control Cabinet- It contains various electric parts through which the operating and controlling of the machine is done.

Pyometer



A pyrometer is a such type of instrument that can measure the temperature remotely by measuring the radiation emitting from the object. So, where the temperature is needed to recorded without contact with object a pyrometer can be used. Pyrometer can be of two basic types namely optical pyrometer and infrared pyrometer.

Principle- It is based on the principle that the intensity of light received by the observer depends upon the distance of the observer from the source and the temperature of the distant source. A modern pyrometer has an optical system and a detector.

5 HAPT.

Yantropakaranani -II (Equipment's, fuel and Heating Devices)

Syllabus

Principle involved, importance of temperature, currently used heating devices utility, quantum of heat and Instruments used in Large scale Production Puta- Chandra Puta, Surya Puta, Maha Puta, Gaja Puta, Varaha Puta, Kukkuta Puta, Kapota Puta, Lavak Puta, Budhar Puta, Gorvara Puta, Valuka Puta Kumbha / Bhanda Puta

Musha- Samanya Musha, Crucibles- Silica, Mudra, Sandhi Bandhan Material

Koshti- Chullika, Angar Koshti, Satwapatan Bhrashtri, Gas Stove, Hot Plate, Heating Mantle, Induction Stove, Hot Air Oven, Muffle Furnace- Horizontal and Vertical

Heating Material- Solid- Kashtha, coal(wooden / stone), Kshara, Lavana, Valuka, Shakrit, Dhanya Drava- Jala/ steam, Taila. Indirect heating- Dhanya Rashi, Bhugarbha sthapana

Learning objectives

- Describe the term Yantra and enlist yantras described in classics useful for Aushadhi Nirmana.
- Define the term Puta and recite its classical explanation.
- Produce categorical information (Size of Pit, Number of cow dunk cakes, use etc.) about following Putas viz. Mahaputa, Gajaputa, Varahputa, Kukkutaputa, Kapotputa, Lavakputa, Kumbhaputa, Bhandaputa, Valukaputa and Bhudharputa.
- Recognise the principles behind construction and working of the classical Putas.
- Identify and enlist contemporary devices used in the preparation of Bhasma.
- Review the temperature pattern of various Putas by referring research articles.
- Compile names and significance of temperature measuring devices with reference to Puta.
- Enlist the specific Puta used for a particular Bhasma Nirmana.
- Enlist various devices used for heating during Ayurvediya Aushadhi Nirmana.
- Enlist constituents needed for Samanya Musha Nirmana.
- Define the term Musha and describe uses of various types of Musha.
- Enlist and discuss the material used for Sandhi Bandhan (while using Sharava and Kachakupi) Identify and record the types of Crucibles.
- Interpret the effect of heat transformation in the material subjected to heating through Musha.
- Recall Pakaj Utpatti Siddhant and interpret it for Agni Sannikarsha Sanskara.
- Explain the Pharmaceutical use of the Hot plate, heating mantle, induction stove, hot air oven, muffle furnace (horizontal and vertical type)
- Describe types of Koshti and their uses Describe the Current trends in heat transfer device e.g. steam jacketed heating device, programmed muffle furnace, programmed furnace for Parpati / Pottali preparation.
- Assess and interpret the effect of fuel in quantum of heat given (time and temperature)

- Enlist various fuels used for heating for estimation of their heat value.
- Analyse and appraise use of proper heating device and fuels used for Ayurvediya Aushadhi Nirmana.

Total - 09 hours (Lecture :05 hour, Non-lecture: 04 hours)

Marks- 5 marks, LAQ (10 Marks)- No, SAQ (5 Marks)- Yes, MCQ- Yes

Introduction

Purificatory procedures like Shodhana, Marana, Satvapatana etc. which are useful in making the substances, involve heating or boiling. During heating the temperature should be optimum so that the required final product should be rich in qualities. So, the unit of heat required for the optimization of temperature is necessary.

In Ayurveda, especially in Rasashastra, during any procedure unit of heat required for obtaining the proper measurements. They are mentioned in terms or qualitative and quantitative measurements. The Puta is the word given to express unit of heat in Ayurveda.

Puta

The word Puta means Vivar, Hollow (Sanskrit Hindi Kosha, Vamana Shiva Ram Aapte) i.e. empty place. It is defined in Rasa texts as follows.

धातुषूपलेन्धनदाहः **पुटम्।** (रसकामधेनु उप. 2/25)

रसादि द्रव्य पाकानां प्रमाणज्ञापनं पुटम्।
नेष्टो न्यूनाधिकः पाकः सुपाकं हितमौषधम्॥
(R.R.S. 10/47)

Incineration of metals in heat of Upala is known as Puta. Puta is indicative of proper Paka of Rasadi Dravyas that is done by applying proper quantum of heat. Quantum of heat should be neither less nor more according to nature of Rasa Dravya so that after process the proper Paka should be carry out so that Rasa Dravya is converted into Hitkara Aushadhi. Here for this process more Paka or less Paka is not desired.

Concept of Puta- The concept of puta can be understood in two steps

1. Application of Heat
2. Changes by Heat

Application of heat- Put is the process by which appropriate quantum of heat is applied according to nature of various Rasa Dravyas. The quantum of heat given to a particular Dravya is controlled by following definite rules which is as follows.

- By fixing the dimensions (Length, width and height) of various Puta for example it is Raja Hastra Pramana in case of Gajaputa.
- By fixing the number of Upla according to different Puta so that energy liberate during the process could be fixed.
- By fixing the amount of Dravya taken for Puta process. So that equal heat should applied to all.

Temperature pattern in Puta can be divided into 3 stages-

1. Ascending temperature
2. Peak temperature
3. Descending temperature

This temperature pattern is different according to different Puta.

Ascending temperature- This is the stage when after lighting the fire temperature increases gradually.

Peak temperature- When temperature during the process reaches at its peak.

Descending temperature- When temperature drops down gradually and at last self-cooling stage is achieved. During these temperature pattern chemical reaction takes place and a stable compound is formed according to initial material taken for the process.

Average temperature pattern in various Puta

Changes by heat- With the application of heat Rasa Dravyas are converted into Bhasma which

has definite therapeutic properties. According to modern view these are converted into stable compound. For example, if it is prepared with Gandhaka then there is formation of sulphide and when Bhasma prepared by only giving Bhavana there is chance of presence of oxide compound. Besides these some other trace elements could be present which may come from Bhavana process.

One puta cycle can be illustrated as below:

Rasa Dravya +→Bhavana → Pillet preparation

Bhavana Drava ↑ ↓

If Bhasma is prepared it is used | If Bhasma is not prepared ↑ | Placing of Pillets into Sharava ↓

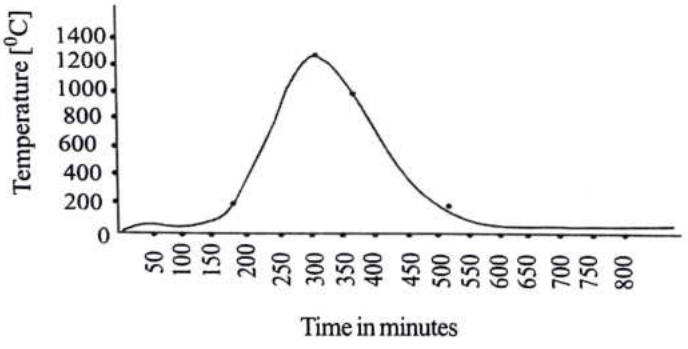
Sharava Samputa ↓

Powdering of pellets ← Self cooling ← Puta

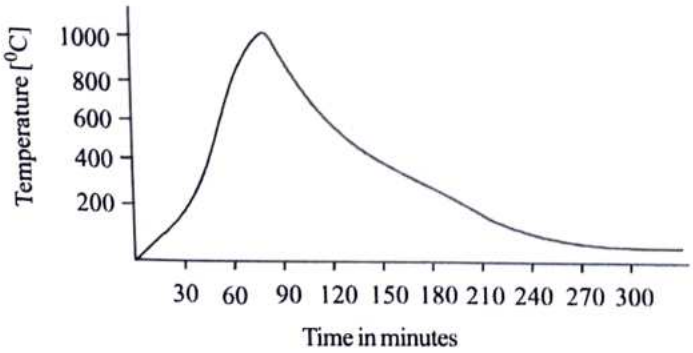
The above process is known as one Puta cycle. If there is indication of eight Putas then this process is repeated for eight times and if there is indication of seventy Puta then it is repeated for seventy times and so on.

Quantum of Heat-

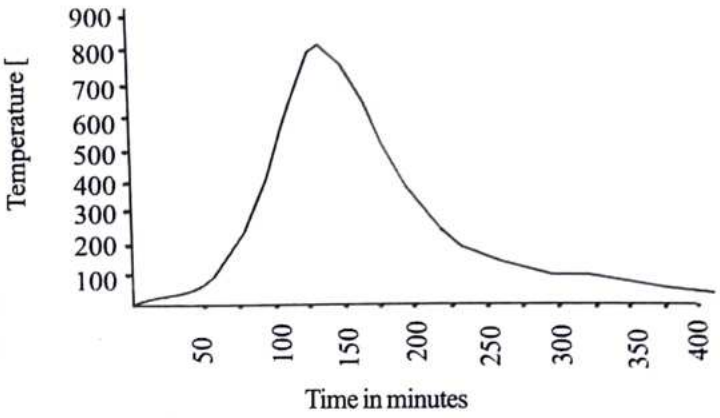
Mahaputa



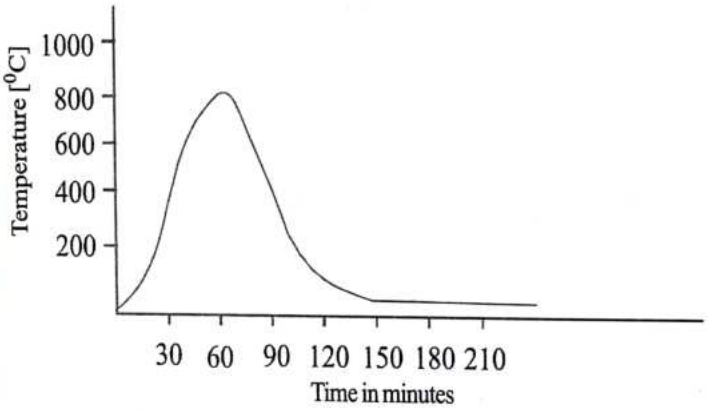
Gaja puta



Varaha puta



Kukkuta puta



Chandra Puta (Ref- Rasa Tantra Sara)

Various Pishtis are given Bhavana is presence of Moon light then this process is also termed as Chandra puta. Example- Pravala Bhasma

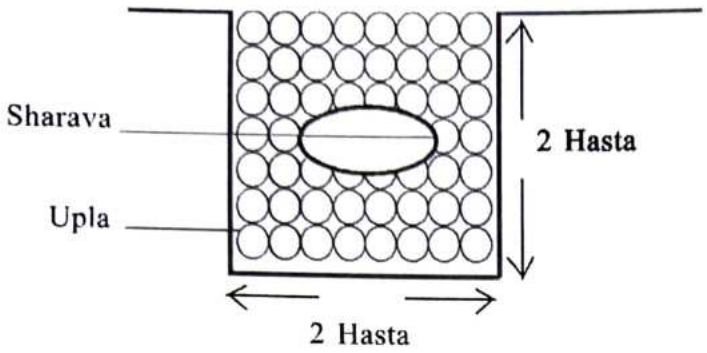
Surya Puta/ Rudra / Bhanu Puta

द्रव्याणां भावितानान्तु भावनौषधजै रसैः ।
शोषणं सूर्यतापे यत्तत्सूर्यपुटमुच्यते ॥
(R.T. 3/37)

When Dravya is dried in Sunlight during the process of Bhavana given by juice of Bhavana Aushadhi then it is known as Surya Puta.

Maha Puta

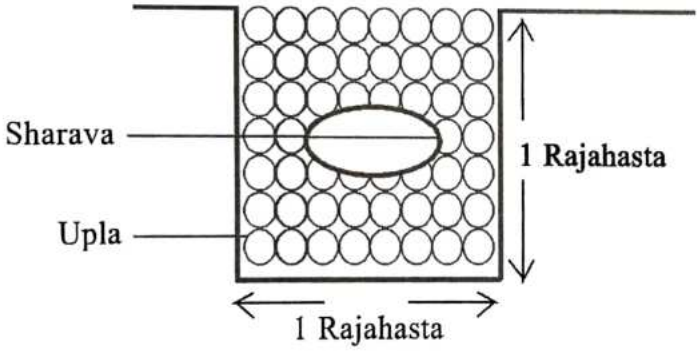
निम्नेविस्तरतः कुण्डे द्विहस्ते चतुरस्त्रके ।
वनोपलसहस्त्रेण पूरिते पुटनौषधम् ॥
क्रौञ्च्यां रुद्धं प्रयत्नेन पिष्टिकोपरि निक्षिपेत् ।
वनोपलसहस्त्रार्धं क्रौञ्चिकोपरि विन्यसेत् ॥
वह्निं प्रज्वालयेत्तत्र महापुटमिदं स्मृतम् ॥
(R.R.S. 10/51-52)



Maha Puta is an arrangement of heating in a pit having length, breadth and depth of 2 Hasta (91.44 cm). In which firstly one thousand Upala are filled then Musha having Putan Dravya is kept and then five hundred Upala are placed over it and it is ignited.

Example- For the Marana of Tamra, Parada, Suvarna, Vajra and to prepare Trivanga Bhasma.

Gaja Puta



राजहस्तप्रमाणेन चतुरस्त्रं च निम्नकम्।
पूर्णं चोपलसाठीभिः कण्ठावध्यथ विन्यसेत्॥
विन्यसेत् कुमुदीं तत्र पुटनद्रव्यपूरिताम्।
पूर्णच्छगणतोऽर्धानि गिरिण्डानि विनिक्षिपेत्॥
एतद्गजपुटं प्रोक्तं महागुणविधायकम्॥
(R.R.S. 10/53-54)

Gaja Puta is an arrangement of heating in a pit having one Rajahasta (55.88 cm) length, breadth and depth. Up to neck of pit is filled with cow dung cake then Musha containing Putan Dravya is kept now Upala in half of the amount to that of kept previous are kept and ignited. Here the number of Upala is not given.

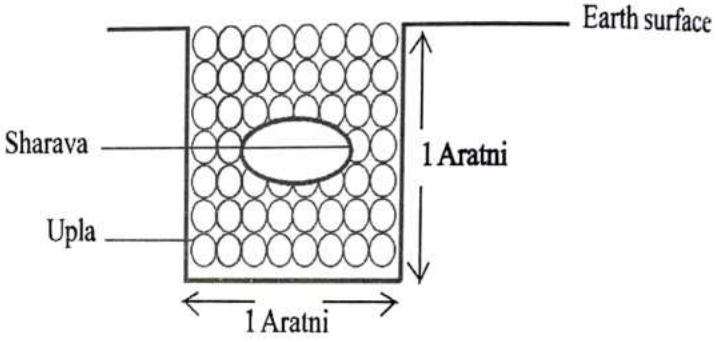
Rasa Prakash Sudhakar has specified the number of Upala.

Example- For the Marana of Akika, Abhraka, Rajata, Yashada, Loha, Hartala, Godanti Bhasma.

राजहस्त प्रमाणं हि चतुरस्त्रं च गर्तकम्।
वनोत्पल सहस्त्रेण गर्तमध्यं च पूरयेत्॥
(R.P.S. 10/43)

One thousand Upala are to be filled in a pit having dimensions of Raja Hasta. The synonym for Gaja Puta is Varanakhya Puta.

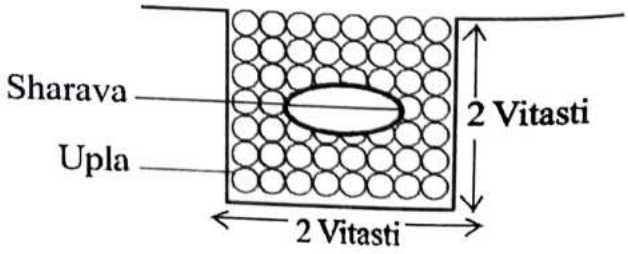
Varaha Puta/Kroda Puta



इत्थं चारत्निके कुण्डे पुटं वाराहमुच्यते।
(R.R.S. 10/55)

The Varaha Puta is an arrangement of heating in a pit having One Aranti (41.91 cm) length, breadth and depth. Half the pit filled with cow dung cakes (150 number). The Sarava Samputa is put upon it and the empty space above is filled with cow dung cakes and ignited. The synonyms for this Puta are Kroda Puta. Here quantity of cow dung cake is not mentioned so Upala sufficient to fill the pit should be taken. Example- To preparation of Bhasma of Abhraka, Tamra, Rajata, Suvarna Makshika etc.

Kukkuta Puta



Kukkuta Puta

पुटं भूमितले तत्तद्वितस्तिद्वितयोच्छ्रयम् ।
तावच्च तलविस्तीर्णं तत्स्यात्कुक्कुटकं पुटम् ॥
(R.R.S. 10/56)

The Kukkuta Puta is an arrangement of heating on the surface of earth putting the Upala in height of 2 Vitasti. Example- To preparation of Tutha, Parada, Loha, Suvarna Bhasma.

Note- The other opinion regarded to Kukkuta Puta is described here Acharya Sharangadhara has described use of 5 or 30 Upala in this Puta regarding the preparation of Svarna Bhasma.

प्रदद्यात्कुक्कुटपुटं पञ्चाभिर्गोमयोपलैः ॥
(Sha. Mad. 11/18)

त्रिंशद्वनोपलैर्दद्यात्पुटान्येवं चतुर्दश ॥
(Sha. Mad. 11/6)

Kukkuta Puta described in Vaidyaka Shabda Sindhu by Narendra Nath Sen is as follows :

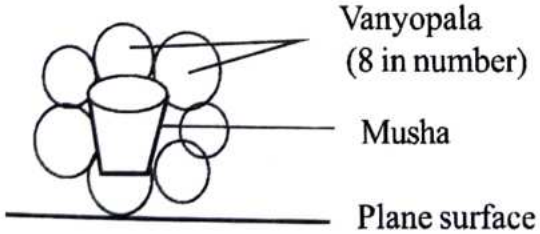
हस्त प्रमाण खाते दशवन करीष कृतौषपुटः कुक्कुट पुटः ।

The Puta which is given by using ten Upla in a pit having dimensions of one Hasta.

वितस्ति मात्रके खाते कथितं कौक्कुटं पुटम् ।

- The Puta given in Pit having dimensions of one Vitasti is also known as Kukkuta Puta.
- The Puta given in the Pita having dimensions of sixteen Angula or six Angula is also known as Kukkuta Puta.

Kapota Puta



Kapota Puta

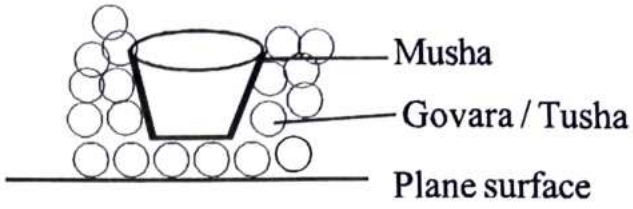
Kapota Puta also known as Laghu Puta, Mrudu Puta and Swalpa Puta.

यत्पुटं दीयते भूमावष्टसङ्ख्यैर्वनोपलैः ।
बद्ध्वा सूतार्कभस्मार्थं कपोतपुटमुच्यते ॥
(R.R.S. 10/57)

The Puta which is given on plane surface by using eight Vanyopala known as Kapota Puta.

Use- To prepare Parada Bhasma.

Lavaka Puta



ऊर्ध्वं षोडशिकामूत्रैस्तुषैर्वा गोवरैः पुटम् ।
यत्र तल्लावकाख्यं स्यात्सुमृदुद्रव्यसाधने ॥
(R.R.S. 10/63)

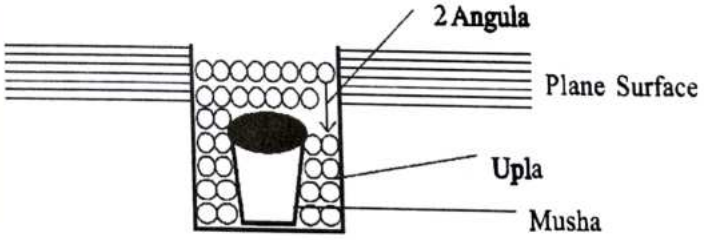
The Puta which is given by using Tusha or Govara in the quantity of 1 Shodashika (one Pala) then it is known as Lavaka Puta.

Use- For the Puta of Mridu Dravya.

गोवरैर्वा तुषैर्वापि वितस्तयूर्ध्वं पुटन्तु यत् ।
मृदु द्रव्यप्रसिद्ध्यर्थं तल्लावकपुटं मतम् ॥
(R.T. 3/38)

Rasatarangini has indicated that heap of Tusha or Govara having height of one Vitasti should be used for this Puta.

Budhara Puta



वह्निमित्रा क्षितौ सम्यङ् निखन्याद् द्व्यङ्गुलादधः ।
उपरिष्टात्पुटं यत्र पुटं तद्भूधराह्वयम् ॥
(R.R.S. 10/62)

In this Puta Musha is kept underground below two Angula level and heat is provided by burning cow dung cakes over the Musha.

Use - To prepare Parada Bhasma and Jarna

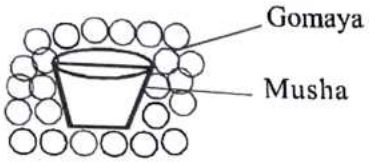
भूमिगर्भं कुमुदिकां विन्यस्य द्व्यंगुलोपरि ।
यद्दीयते पुटं तत्तु पुटं भूधर सँज्ञकम् ॥
(र.त.3/47)

A pit is dug on ground and Musha is placed in it. Over it, a compound of two Angula height is

constructed and Upalas are placed in it, and subjected to fire. This set up is called as Bhudhara Puta. Some scholars have mentioned to fill the pit with Sand and the Musha. There is no mentioning about the number of Upalas to be used. It depends upon the quality of the drug.

Use: Bhudhara Putas used in Paka of Parada and Somala.

Gorvara Puta



गोष्ठान्तर्गोक्षुरक्षुण्णं शुष्कं चूर्णितगोमयम्।
गोवरं तत्समादिष्टं वरिष्ठं रससाधने॥
गोवरैर्वा तुषैर्वापि पुटं यत्र प्रदीयते।
तद्गोवरपुटं प्रोक्तं रसभस्मप्रसिद्धये॥
(R.R.S. 10/58-59)

Cow dung which is made into powder form and is dried by the hoof of cow in the cowshed is termed as Gorvara. It is superior for Rasa Sadhana. The Puta is which Gorvara or Tusha is used as fuel or given by using Gorvara or Tusha is known as Gorvara Puta. It is used for the preparation of Rasa Bhasma.

Note- This Puta is given on plane surface and according to Aacharya D.A. Kulkarni 8 Upala are used for this Puta.

Valuka Puta

अधस्तादुपरिष्टाच्च क्रौञ्चिकाऽऽच्छाद्यते खलु।
बालुकाभिः प्रतप्ताभिर्यच्च तद्बालुकापुटम्॥
(R.R.S. 10/61)

In Baluka Puta Musha is kept and covered from up and down with hot sand in a pit and as here heat is applied through hot sand so it is called Baluka Puta.

Use - To prepare Lavana, Kshara.

प्रतप्त वालुकागर्भे न्यस्य मूषादिकं दृढम्।
यद्दीयते पुटं तत्तु वालुकापुटमुच्यते॥
(र.त.3/46)

Valuka Puta is used by placing Samputa inside the heap of sand. For this Puta, a pot is taken, filled with hot sand up to half. Then the Samputa is placed and the rest of the space inside the pots filled with hot sand. And this set up is subjected to fire for a fixed time period. In some contexts, Kshara or Bhasma (wooden ash) is used in place of hot sand.

Kumbha/Bhanda Puta/ Mridu Bhanda Puta

The Musha is kept into an earthen vessel and Puta is given so it is termed as Kumbha Puta.

पूर्णं चोपल साङ्गीभिः कण्ठावध्यथ विन्यसेत्।
कलशीं तत्र विभजेत्पुटन द्रव्यपूरिताम्॥
(Rasa. Kam. Up. 2/38)

An earthen vessel or pit having Kumbha shaped is filled with Upala to its neck then Musha is kept and it is covered by Upala and lignified. This arrangement is known as Kumbha Puta. Rasa Ratna Samuchchaya has described Bhanda Puta which is as follows-

स्थूलभाण्डे तुषापूर्णे मध्ये मूषासमन्विते।
बह्निना विहिते पाके तद्भाण्डपुटमुच्यते॥
(R.R.S. 10/60)

A big earthen pot is filled with Tusha up to mid part then Musha with Putana Dravya is kept and then the rest part is filled with Tusha and it is ignited. It is known as Bhanda Puta.

Use-In Marana process of Haratala, Somala etc.

क्षिप्त्वाऽग्नि मुद्रयेद् भाण्डं तद्भाण्डपुटमुच्यते।
(Bha./Dhatu. Sho. 3/32)

Acharya Bhava Mishra is of opine that after ignition of Tusha the mouth of pot is closed by sealing.

Use - To prepare Hartala, Somala Bhasma.

Anukta Puta Pramana

अनुक्तपुटमाने तु साध्यद्रव्यबलाबलात्।
पुटं विज्ञाय दातव्यमूहापोहविचक्षणः॥
(R.R.S. 10/64)

Where there is no indication of Putamana then it should be decided after proper consideration of

the nature of the Putana Dravya. The nature can be considered as hardness or softness and the chemical nature of that particular Dravya.

Musha

Heating process is required to perform various process of Rasa shastra. It includes Shodhana, Marana, Satvapatana, Drutikarana etc. This process required a temperature range from 500C to 17000C. For example, Swedana process needs the temperature around 1000C while Satva Patana required 18000C as in case of Abhraka. Musha is used for melting, Satva Patana, Marana etc.

Musha Defination

मुष्णाति दोषान्मूषेयान् सा मूषेति निगद्यते।
(R.R.S. 10/2)

The Yantra which destroys the removable Doshas (impurities) is called Musha.

Synonyms- Musha, Kraunchika, Kumudi, Karhatika, Pachani, Vahnimitra.

Samanya Musha

या मृत्तिका दुग्धतुषैः शणेन शिखित्रकैर्वा हयलदिना च।
लोहेन दण्डेन च कुट्टिता या साधारणा स्यात्खलु मूषिकार्थे॥
(R.R.S. 10/7)

To prepare Samanya Moosa following ingredients are needed :

- Soil (having quality described above) - 4 Parts
- Dagdha Tusha (Burnt husk) - 1 Part
- Shana (Jute) - 1 Part
- Shikhitraka (Burnt charcoal powder) - 1 Part
- Hayaladi (Horse faecal matter)-1 Part

Above ingredients are taken and pounded well by pestle made up of iron. When it becomes soft and smooth the Musha is prepared.

Uses- Satva Patana

Vajra Musha

मृदस्त्रिभागाः शणलद्विभागौ भागश्च निर्दग्धतुषोपलादेः।
किट्टादर्धभागं परिखण्डय वज्रमूषां विदध्याद् खलु सत्वपाते॥
(र.र.स.10/9)

Mud - 3 parts, grass leaves, - 1 part, horse dung- 1 part, mandoora powder - $1^1/_2$ part all these ingredients are taken together, pouned well, made into a bolus, given proper shape. Such a Musha is called as Vajra Musha. This is so called because it can withstand a very high temperature. The Vajra Musha is especially used in Satwapatana process of hard substances.

Pakwa Musha

कुलालभाण्डरूपा या दृढा च परिपाचिता।
पक्वमूषेति सा प्रोक्ता पोट्टल्यादिविपाचने॥
(र.र.स.10/27)

This Musha is prepared by common mud. The shape resembles the small mud pot. This Musha is prepared by subjected it into high temperature. So the name Pakwa Musha. This is used in Pachana of Pottali etc.

Gostani Musha

मूषाया गोस्तनाकारा शिखायुक्तपिधानका।
सत्वानां द्रावणे शुद्धौ मूषा सा गोस्तनी भवेत्॥
(र.र.स.10/25)

The shape of Gostani Musha is similar to that of cow udder (cylindrical). The covering lid will be having a handle, so that the lid can be open-end anytime during a process. Gostani Musha is useful in melting Satwas and in purification. While a substance is being melted, the lid may be opened with the help of the handle to check the melting.

This Musha is prepared by triturating dried earthworms, mud & ash of hey with buffalo milk.

Crucibles

A crucible can define as a container usually cup shaped made up of ceramic, metal or other material in which melting of substances at high temperature can be performed. They can be made from different material like clay, graphite, the crucibles may contain lid and are of silica, nickel, platinum etc.

The crucible are used in:

1. Melting of substances
2. Chemical analysis

3. Research purposes (Ash value, loss on Ignition)

Silica crucible- These crucibles are made of pure fused silica these types of crucible exerts a very low coefficient of thermal expansion due to this it allows quick heating and cooling with no risk due to thermal breakage. These crucibles can with stand on high temperature range, and corrosion due to chemicals in comparison to porcelain crucible.

Mudra

The word Mudra is indicative of corking. In the Upakarana Pada of Rasa Ratnakar two types of Mudras are given. These are-

1. Hatha Mudra
2. Madan Mudra

Hatha Mudra

चुम्बक लौह चूर्ण च क्रोडरक्तेन संयुतम्।
तत्र सर्वं प्रदातव्यं घनघातेन ताडयेत॥
सन्ध्यारम्भोदयो यावत् सूर्य विम्बं न दृश्यते।
हठमुद्रेति विख्यातं सर्वसिद्धैर्नमस्कृता॥
(Rasa. Ratna. Upa. 1/249)

Constituent material :

1. Chumbaka Lauha Churna (Magnet powder)
2. Kroda Rakta (Pig's blood)

Both of these are mixed and pounded with heavy impact. The pounding is done throughout night. This type of Lepa is termed as Hatha Mudra. It is useful in sealing Prada inside a Musha and protect Parada from high temperature.

Madana Mudra

औदुम्बराख्य वटदुग्धंपलं पलञ्च लाक्षापलमृषिपलं त्वथ चुम्बकस्य। सङ्कुट्यमानमतसीफलतैलमिश्रं सूतस्य जारणाविधौ मदनाख्य मुद्रा॥ (Rasa. Ratna. Upa. 1/256)

Constituent material :

- Udumbara - 1 Pala
- Vata Ksheera - 1 Pala
- Laksha - 1 Pala
- Chumbaka - 7 Pala
- Oil of Linus utitasisimum - Q.S.

Above materials are pounded well with the help of oil of Linus utitasisimum and made into consistency of Madana (Wax). It is known as Madana Mudra and used during Jarana of Parada. In other description available in Rasa Ratnakara, it is prepared with wax and it is superior for the Mudra of Jala yantra (Where water is used).

Use- To seal Kupi and Musha, useful in Parada Jarana and Marana.

Sandhi Bandhan Material

मूषादीनां तु यत्सन्धौ किट्टाद्यैः स्याद्विलेपनम्।
वत्सन्धिलेपनं ख्यातं तच्चोक्तं सन्धिबन्धनम्॥
(R.T. 3/5)

The sealing of Musha and Sharava joint with the help of paste of Kitta etc. is known as Sandhi Lepana. It is also termed as Sandhi Bandhana.

वल्मीकमृत्तिकांऽगारपूरणं लोहकिट्टकम्।
श्वेतपाषाणकं चैव तत्सर्वंचूर्णयेत्समम्॥
सर्वतुल्यं दग्धतुषं तोयेनैव विमर्दयेत्।
मूषादि संपुटं कुर्यात्सर्वसंधि प्रलेपनम्॥
(Rasa. Ratna. Upa. 1/183-84)

Valmika Mrittika, Coal, Louha kitta, Sweta Pashana ($CaCO_3$) in equal amount, Dagdha Tusha in amount equal to all four ingredients then it is ground with water and used for sealing of Musha.

Toya Mrittika

लेहवत्कृतबब्बूल क्वाथेन परिमर्दितम्।
जीर्णकिट्टरजः सूक्ष्मं गुडचूर्णसमन्वितम्।
(R.R.S. 9/62)

Decayed Lauha Churna and Guda is triturated with the help of Babbola Kwatha till it becomes as Leha. It is used for sealing purpose where water is present.

Vahin Mrittika

खटिकापटुकिट्टैश्च महिषीदुग्धमर्दितैः।
वह्निमृत्स्ना भवेद्धोरवह्नितापसहा खलु॥
एतया मृत्स्नया रुद्धो न गन्तुं क्षमते रसः।
(R.R.S. 9/63)

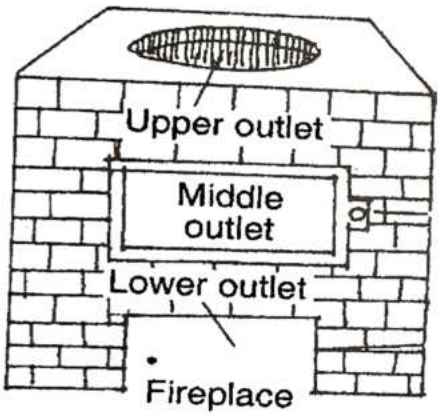
The smooth paste is made by taking Khatika. Patu (Lavana) and Lauha Kitta while triturating with the milk of buffalo. It is Vahin Mrittika which can tolerate high heat. The loss of Parada by means of heat can be restricted by the sealing of Vahin Mrittika.

Koshti

सत्त्वानां पातनार्थाय पातितानां विशुद्धये।
कोष्ठिका विविधाकारास्तासां लक्षणमुच्यते॥
(R.R.S. 10/32)

Koshti having various shape are used for Satva extraction and Shodhana of extracted Satva their characteristics are described here.

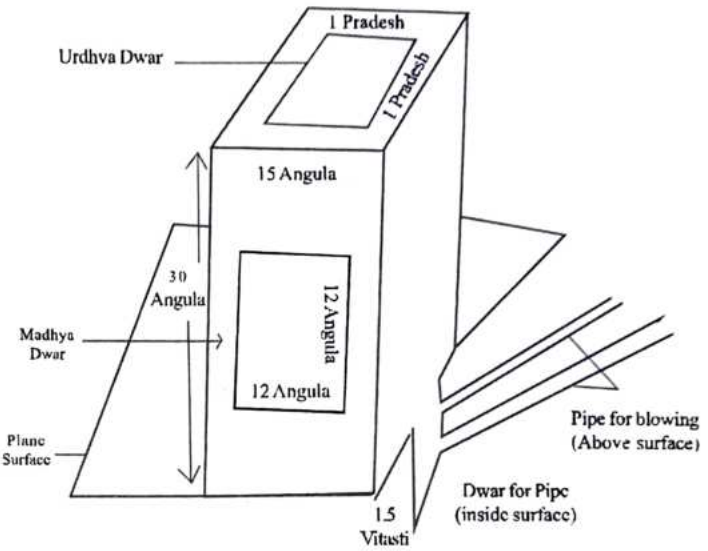
Chullika



अष्टादशांगुलोत्सेध प्रमाणायामवेष्टनाम्।
वल्मीकाकारवद्वृत्तामधोभागे बृहत्तराम्॥
कोष्ठीवच्छुषिरामन्तः पञ्चगुल्फाग्रसंयुताम्।
प्राकाराग्रे यथा गुल्फास्तथागुल्फांश्च कारयेत्॥
मूलभागे प्रकुर्वीत बहिर्द्वारं च कारयेत्।
द्वादशांगुल विस्तारं चतुरस्त्रं समन्ततः॥
सद्वारा चुल्हिका कोष्ठी रसज्ञेषु इयं मता॥
(Rasa. Ratna. Upa. 2/1-4)

A device (Which must have height of eighteen Angula) having shape of Valmika in the neck region and expanded at downward, its inside is attached with iron rods with pores. In the neck there is base which have shape of Gulfa. It should have width of twelve Angula in Ura region from which fire is provided.

Angar Koshti



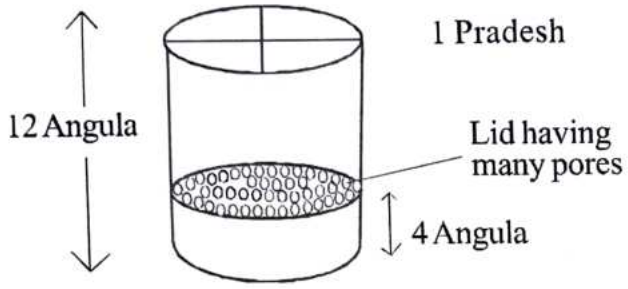
राजहस्तसमुत्सेधा तदर्धायामविस्तरा।
चतुरस्त्रा च कुड्येन वेष्टिता मृन्मयेन च॥
एकभित्तौ चरेद् द्वारं वितस्त्याभोगसंयुतम्।
द्वारं सार्धवितस्त्या च सम्मितं सुदृढं शुभम्॥
देहल्यधो विधातव्यं धमनाय यथोचितम्।
प्रादेशप्रमिता भित्तिरुत्तरङ्गस्य चोर्ध्वतः॥
द्वारं चोपरि कर्त्तव्यं प्रादेशप्रमितं खलु।
ततश्चेष्टिकया रुद्ध्वा द्वारसन्धिं विलिप्य च॥
शिखित्रैस्तां समापूर्य्य धमेद्भस्त्राद्वयेन च।
शिखित्रान् धमनद्रव्यमूर्ध्वद्वारेण निक्षिपेत्॥
सत्त्वपातनगोलांश्च पञ्च पञ्च पुनः पुनः।
भवेदङ्गारकोष्ठीयं खराणां सत्त्वपातिनी॥
(R.R.S. 10/33-38)

A Koshti having height of 1 Raja Hasta (55.88 cm) and breadth of 27.94 cm is made. A covering wall is made all around which should be smeared with soil/mud. On the upper wall there is opening known as Urdhwa Dwara having length and breadth of one Pradesha. From this opening Charcoal as well as Satva Patana Dravya (In the form of ball) should be entered into it. Maximum five balls can be dropped at a time. There should one Madhya Dwara (Middle opening) in any wall which will be situated in the middle and its length and breadth should be 12 Angula. Before the procedure of Satvapatana this opening should be closed by using brick and mud and furnace should be filled with charcoals. There should be Dhaman

Dwara (Opening for blowing) in its base to whom two tubes will be attached which have its opening on the surface. By means of this tube air will be blown.

Use- This Koshti should be used for the Dravya which have higher melting temperature and needs continuous heating.

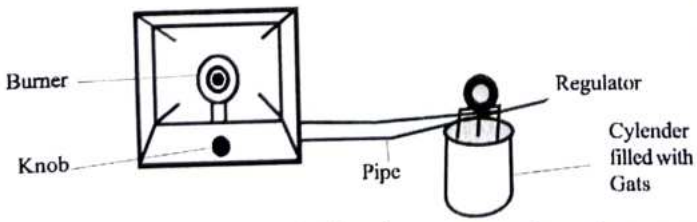
Satvapatana Bhrashtri (गारकोष्ठी)



वितस्तिप्रमिता निम्ना प्रादेशप्रमिता तथा ।
उपरिष्टात् पिधानं तु भूरिछिद्रसमन्वितम् ॥
गर्तमापूर्य चाङ्गारैः प्रघमेङ्कनालतः ।
गारकोष्ठी समुद्दिष्टा सत्त्वपातनहेतवे ॥
(R.R.S. 10/38-39)

Make one foot long, deep and wide pit, (Pradeshapramita), then make round hole of 4 figures diameter in one of the plates of this deep place a lid (Pighana) with many holes on it. Fit the mouth of cuneiform tube into the same hole. Keep fire and coal in the pot and make it stable. Again, put the liquid for Satvapatana in bowl and do the fire. It is called Garakoshti, it is used to melt minerals and produce Satvapatana.

Gas stove



A stove can be defined as an enclosed space within which fuel is subjected to burn to heat whether the space in which the stove is situated or items put on the heated stove. Depending upon the fuel used the stoves are known. In gas stove liquifying petroleum gas or other flammable gas like natural gas, propane etc. can be used. In this system gas is fed into the stove which is connected to cylinder filled with gas or by pipelines etc. The stoves have burner on the top before reaching to burner gas combines with air before ignition. Depending upon energy need the size of burner can be made. Burner heat is calculated in terms of British thermal units (BTU).

The Gas stove consists of following parts-

1. Stove with burner and knob for regulation of supply of fuel
2. A pipe connecting stove with cylinder or other supply sources
3. Cylinder or pipeline with regulator

Hot Plate

The hot plate consists of a top, round or flat, that can be heated by means of electric filaments. This type of heating appliances is normally used for cooking applications but can also be used in laboratory for scientific purposes. Hot plates are frequently used for various industries like mining, electronics and plastic etc. The size of hot plate varies according to its use viz laboratory, domestic or industrial. The working of hot plate includes as electric current flow through the wire and electric energy converted into heat energy leading to heating of top (Plate). In Rasashastra hot plates can be used as heating device in Tapta khalwa yantra. Hot plate consists of a knob from which temperature can be adjusted.

Heating Mantle

Heating mantle is also known as heating nest, is mantle or heating basket. Heating mantles may occur in different forms. In a normal arrangement

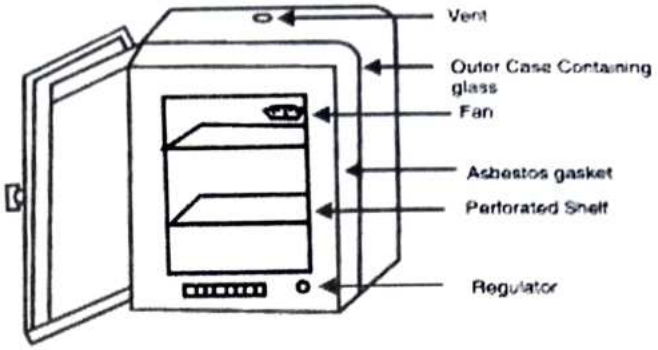
there is a strip of fabric is wrapped around the electric wires and is made into a basket or nest shape. The current is applied to the device and the temperature is achieved. The temperature is regulated by a rheostat. The maximum temperature achieved by heating mantle is 4000C. Heating mantles are used for heating organic liquid as these have tendency to burst into flame when exposed to direct heat. The advantage of heating mantle is that glassware etc. are not in direct contact of heat.

Induction Stove

An induction stove changes electrical energy by induction from a coil of wire into a vessel that must be ferromagnetic. In an induction stove a coil of copper wire is put under the cooking vessel and an alternating current (AC) is passed from it. The resulting oscillating magnetic field wirelessly induces an electric current in the pot. Induction cooking heats a cooking vessel by means of electric induction besides to those of thermal conduction or an electric heating element. So that the cooking vessel in this heating must be of or contain ferromagnetic metal like stainless steel or cost iron. Pans made up of copper or aluminium would not work unless they have additional layer to the bottom of pan that are magnetic. The efficiency of induction stove is better to that of gas or electric stove as the former in approximately use ten percent more energy transfer

Hot Air Oven

An induction stove changes electrical energy by induction from a coil of wire into a vessel that



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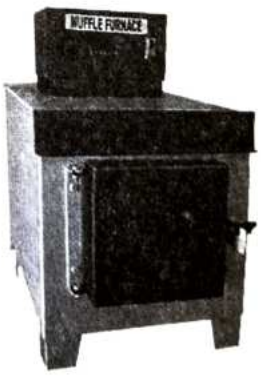
Muffle Furnace-Horizontal and Vertical

Electric Muffle Furnace (E.M.F.)



Electric Muffle Furnace is used for the process or Kupi Paka for example Rasa Sindoor, Svarna Vanga etc. and Bhasma preparation for example Tamra, Godanti, Shankha etc. these are of two types.

1. Horizontal EMF - used for Bhasma preparation
2. Vertical EMF - used for Kupi Paka

EMF looks like rectangular box. The inner surface is fitted with coils through these coils by means of electricity heat is provided. There is a door on upper side as in case of vertical EMF while in case of horizontal EMF door is present on front wall. Through this door Kupi or Shrava is kept into EMF. The remaining place around the door is packed with fire wool so that loss of heat can be checked. For the temperature control there is a set button by which desired temperature is fixed and it is displayed by means of a small screen. Another display shows the actual temperature when actual temperature is reached to set temperature then by means of auto cut it maintains on this temperature. It works by electricity.

Heating Material

Solid- Kashtha, coal (wooden / stone), Kshara, Lavana, Valuka, Shakrit, Dhanya

Kashtha -Kadhira, Asana tree wood is used to obtain Agni (fire). This type of fire used for Parada Paka procedure.

Madhuka, Khadira, Bamboo and Plum coal were used to provide Agni (fire). Madhuka and Khadira coal used for Satvapatana and Bamboo and Plum coal used for Swedana. (R. R. S. 8/ 36)

Coal (wooden / stone)- This also known as Anthracite or Hard coal. It is compact and sub metallic lustre, provides more energy and burns well, it is used for Satvapatana of Dhatu.

Kshara, Lavana and Valuka-Agni (fire) is provided indirectly through these three substances. They are heated by fire and when they heated, various substances are cooked.

Example

- Punarnava Kshata used in Haratala Bhasma. (A.P. 2/184-187)
- Lavana used in Lavana Yantra. (R.R.S. 9/40)
- Valuka used in Valuka Yantra and Bhudhara YantraR.R.S.9/36-39 and 9/44)

Shakrit and Dhanya

Through both of these, fire is provided in the Tapta Khalva Vidhi, which is used for Parada Shodhana.

अजशकृत्तुषाग्निं च खनयित्वा भुवं क्षिपेत्।
तस्योपरि स्थितः खल्वस्तप्त खल्वो ह्यं भवेत्॥
(A.P. 1/160)

By digging a pit in the shape of Khalva, adding goat Shakruta, Dhanya and fire, burning it and placing a mortar over it, it is called Tapta Khalva. Through this Parada Mardana done.

Drava

Jala/ steam- Water and steam used in Swedana Yantra Vidhi.

Taila

सूते सतैलयन्त्रस्थे स्वर्णादिक्षेपणं हि यत्।
वेधाधिक्यकरं लोहे सारणा स प्रकीर्तिता॥
(र.र.स. 8/86)

Parada is taken in Yantra filled with oil (in a crucible) and Prakeshepa (adding) of metals like Swarna etc. given, which is called Sarana. This enhances the potency of the Parada in the process of Veda of various metals.

Indirect heating

Dhanya Rashi- One part of the purified Parada and two parts of purified Gandhaka are ground to Kajjali, added to the equal quantity of powder of Loha and triturated into the juice of Kumari for two prahara (6 hours) to prepare a ball. This ball is covered with a leaf of Eranda and kept in a bronze vessel, heated either in a strong sun ray or on the fire for 1/2 prahara (1-1/2 hours). Later this vessel is kept in the midst of a heap of grains. After 3 days, the ball is taken out, rubbed and sieved in a cloth, which would yield a Varitara (floatable on the water) Bhasma.

With the help of above processes all the 3 types of Loha can be converted into Niruttha Bhasma.

This method is called Siddha yoga, as it has been expounded directly from the mouth of Siddha himself. This process is my (author's) experience too and can cure all the diseases and repels the old age as well. For such benefits, this Bhasma is given with Triphala and honey. (R.R.S. 5/131-135)

Bhugarbha Sthapana- In this method of heating, a pit is dug in the ground and installed in it. This method is used in Shodhana Samskara. By placing the vessel containing Parada and menstruation in a one yard deep in this ground for three days removes the Shadatva of Parada.

6 HAPT.

Kalpana Nirmana I (Primary & Secondary dosage forms)

Syllabus

Definition, classification with suitable examples, reference ingredients, quantity, method of preparation, principle involved, instruments used in small and large scale production, siddhi lakshana, storage, shelf life, modern aspect of related preparation of the following Panchavidha Kashya Kalpana (Primary dosage forms): Swarasa, Kalka, Kwatha, Hima, Phanta

Upaklpana (Secondary dosage forms):

Kalka: Churna Kalpana

Kwatha: Pramathya Kalpana, Paniya Kalpana, Ushnodaka, Ksheera Paka Kalpana, Laksha Rasa, Mamsa Rasa

Hima Kalpana : Mantha Kalpana, Udaka Kalpana, Panaka Kalpana

Phanta Kalpana: Arka

Learning objectives

- Explain Kashaya Kalpana
- Enlist the dosage form come under Panchavidha Kashaya
- Kalpana and their Upakalpana
- Justify Primary, secondary and tertiary dosage form under Panchavidha kashaya Kalpana and their Upakalpana.
- Define with synonyms and classify different varieties of the dosage form in Ayurvediya Aushadhi Nirmana.
- Describe methods of preparation of the dosage form along with the principles of extraction, concentration and dilution etc.
- Explain in details about Standard Operating Procedure (SOP) of each kalpana.
- Enlist details of the applications/administration (samanya Matra, Anupana or sahapana, indications and contraindications) of the dosage form with various examples.
- Assess and discuss modern day development and market trend of the dosage form
- Determine the advantages and disadvantages of the dosage form
- Describe method of preparation of dosage form along with the principle involved
- Describe meaning of the term Upakalpana. Enlist panchavidha kashaya kalpana and their respective Upakalpana
- Explain various kalpas belonging to Various dosage forms -Ingredients, proportion, matra, sevan vidhi if any, therapeutic uses.
- Critically evaluate rationality behind different proportion of water used in various formulations

Total - 10 hours (Lecture :06 hour, Non-lecture: 04 hours)

Marks- 10 marks, LAQ (10 Marks)- Yes, SAQ (5 Marks)- Yes, MCQ- Yes

Most of the Acharyas have counted the number of Kashaya Kalpana as five. These are Swarasa, Kalka, Shruta, Sheeta and Phanta. These five are also known as Primary Kalpana (Maulika Kalpana). Other Kalpana like Avaleha, Asava, Sneha etc. are known as secondary Kalpana because in the preparation of these Kalpana there is use of Primary Kalpana.

According to Acharya Charaka

पंचविध कषाय कल्पनमिति । तद्यथा-स्वरसः कल्कः, शृतः शीतः, फाण्टश्चेति । तेषां यथा पूर्वं बलाधिक्यं,.....

(Cha.Sut. 4/4)

Kashaya Kalpana are of five types these are Swarasa, Kalka, Shrita, Sheeta and Phanta. Their potency increases while morning from Phanta to Swarasa.

According to Acharya Vagbhata

रसः कल्कः शृतः शीतः फाण्टश्चेति प्रकल्पना ।
पञ्चधैव कषायाणां पूर्वं पूर्वं बलाधिका ॥

(As.Hrid.Kalp 6/8)

Kalpana are Rasa (Swarasa), Kalka, Shrita (Kwatha), Sheeta and Phanta. These are more potent to one another while moving from Phanta to Swarasa.

According to Acharya Sharangadhara

अथातः स्वरसः कल्कः क्वाथश्च हिम फाण्टकौ ।
ज्ञेयाः कषायाः पञ्चैते लघवः स्युर्यथोत्तरम् ॥

(Sha. Ma. 1/1)

Swarasa, Kalka, Kwatha, Hima and Phanta are five Kashaya. Their potency decreases while moving from Swarasa to Phanta. Swarasa is most potent while Phanta is least potent among these five.

According to Acharya Sushruta

क्षीरं रसः कल्कमथो कषायः शृतश्च शीतश्च तथैव फाण्टम् ।
कल्पाः षडेते खलु भेषजानां यथोत्तरं ते लघवः प्रदिष्टाः ॥

(Su. Su. 44/91)

That is Ksheera (Latex), Rasa (Swarasa), Kalka, Kashaya (Kwatha), Sheeta and Phanta six Kalpana of Bheshaja and their potency decreases from Ksheera to Phanta onwards.

According to Acharya Kashyapa

चूर्णं शीतकषायश्च स्वरसोऽभिषवस्तथा ।
फाण्टः कल्कस्तथा क्वाथो यथावत्तं निवोध में ॥

(Ka. Khi. 3/35)

Churna, Sheeta Ksahaya, Swarasa, Abhishava, Phanta, Kalka and Kwatha these seven are the Kalpana of Bheshaja.

Table showing the Kashaya Kalpana according to different Aachrges

Sr.No.	Charaka	Sushruta	Vagabhatta	Kashyap	Shrangdhar	Bhava Mishra
1.	Swarasa	Ksheera	Rasa	Churna	Swarasa	Swarasa
2.	Kalka	Swarasa	Kalka	Sheeta	Kalka	Kalka
3.	Shrita	Kalka	Shrita	Swarasa	Kwatha	Kwatha
4.	Sheeta	Shrita	Sheeta	Abhishava	Hima	Hima
5.	Phanta	Sheeta	Phanta	Phanta	Phanta	Phanta
6.	-	Phanta	-	Kalka	-	-
7.	-	-	-	Kwatha	-	-

Pancha Kashaya Kalpana

The five basic Kalpana and their modern correlate is as follows:

1. Swarasa (Expressed juice)
2. Kalka (Paste)
3. Kwatha (Decoction)
4. Hima (Cold infusion)
5. Phanta (Hot Infusion)

Swarasa Kalpana

Swarasa is the primary Kalpana that is found described in the treatment of various diseases. It is generally prepared from fresh drug. Swarasa Kalpana has been used by Aacharya Charaka as Medhya Rasayana as well as for the treatment of diseases like Visham Jwara, Raktapitta etc. Swarasa Kalpana has been used for the preparation of other Kalpana like Amalaki Swarasa for the preparation of Dhatriavaleha etc. and as Sahapana/Anupana for various medicines.

Classification- Swarasa can be of three types-

1. Swarasa from fresh drugs
2. Swarasa from dry drugs
3. Putapaka Swarasa

1. Swarasa from fresh drugs

Method of preparation

According to Acharya Charaka

यन्त्र निष्पीडिताद् द्रव्याद् रसः स्वरस उच्यते।
(Cha. Su. 4)

The juice or liquid obtained by pressing a Dravya by means of Yantra is known as Swarasa.

According to Acharya Vagbhata

सद्यः समुद्धृतात् क्षुण्णाद् यः स्त्रवेत पटपीडितात् ।
स्वरसः स समुदिदष्ट.....॥
(As.Hr.Ka. 6/9)

Freshly collected plant is being macerated by putting into cloth the liquid obtained is known as Swarasa.

According to Acharya Sharangadhara

आहृतात्तत्क्षणाकृष्टाद् द्रव्यात्क्षुण्णात् समुद्धरेत् ।
वस्त्र निष्पीडितो यः स रसः स्वरस उच्यते ॥
(Sha. Mad. 1/2)

The plant, which is not damaged by Sheeta, Agni and insect, is collected and macerated. After that putting it into cloth and by pressing it the liquid that is obtained is called Swarasa.

Synonyms of Swarasa

Rasa, Swarasa and Niryasa (Ash. San. Kalp.) are the synonyms of Swarasa.

Principle involved- Kuttan and Nishpidana

Instruments used in small scale production- Juicer

Large scale production- Juice Extractor

Siddhi Lakshana- Liquid having Gandha, Varna and Rasa of drug

Storage- Swarasa should be used in fresh condition. Now a days fruit juices are stored in cane, glass bottles etc by adding preservatives like benzoic acid, sulphur dioxide for a certain period.

Shelf life-Should be used in fresh condition.

1. Ardraka Swarasa

आर्द्रकस्वरसः क्षौद्रयुक्तो वृषणवातनुत् ।
श्वासकासारूचीहन्ति प्रतिश्यायं व्यपोहति ॥
(Sha.Madh. 1/13)

Ingredients- 1. Fresh Adraka - Q.S.

Instruments/Equipment's- Mortar, Pestle, Cloth, Stainless steel, bowl, knife, measuring flask.

Method of preparation- First outer skin of Adraka is removed carefully with knife and then it is washed with potable water. Small pieces are made with knife and then it is kept into mortar and crushed with pestle. It is now taken out and kept over cloth and Pottali is made. Now by applying pressure so this Pottali Swarasa of Adraka is obtained. It is measured by using measuring flask.

Use- Adraka Swarasa is used in Pratishyaya, Shwasa, Kasa Aruchi with honey.

2. Tulsi Swarasa

पीतो मरिच चूर्णेन तुलसीपत्रजो रसः ।
द्रोणपुष्पी रसो वापि निहन्ति विषमज्वरान् ॥
(Sha.Madh. 1/10)

Ingredients- Freshly collected Tulsi leaves

Instruments/Equipment's- Mortar, Pestle, Cotton cloth, Stainless steel, bowl, measuring flask

Method of preparation- Freshly collected

Tulsi leaves are washed with potable water. Now these are kept in Mortar and curshed well by wing pestle. After that it is taken out and kept over cotton cloth and Pottali is made. By pressing the pottali Tulsi Swarasa is obtained. It can be measured by measuring flask.

Use- This Tusli Swarasa along with Maricha Churna cures Vishma Jwara.

3. Kumari Swarasa

Ingredients- Freshly collected Kumari leaves

Instruments/Equipment's- Knife, Mixer juicer, cotton cloth, stainless steel vessel, Measuring flask, Sieve.

Method of preparation- Firstly leaves are washed with potable water. Now with the help of knife it is cut into two parts in its length. Now the pulp is scrapped and collected into a vessel. This pulp is put into juicer mixer and rotate well. Now it is taken out and filtered by using cotton cloth or sieve. It be measured by using measuring flask.

2. Swarasa from dry drugs

Method of Preparation - In the classics alternative method for obtaining Swarasa from dry drugs is also given. These are as follows

चूर्णानामाढकमाढकमुदकस्यहोत्रस्थितं मृदितपूतं स्वरसवत् प्रयोज्यम् । (Cha .Chi. 1/2/12)

One Adhaka of Churna is soaked into one Adhaka amount of water and left for overnight. On the next day it is filtered and used as Swarasa.

According to Acharya Sharangadhara

कुडवं चूर्णितं द्रव्यं क्षिप्तं च द्विगुणे जले ।
अहोरात्रं स्थितं तस्माद्भवेद्वा रस उत्तमः ॥
(Sha.Ma. 1/3)

One Kudava of Churnita Dravya is soaked into 2 Kudava of water and left for one day and night. After that it is filtered and obtained liquid is Uttama Rasa.

Note- Here the Dravya should be in Churna form. For the Churna the term Vastra Galita is used that is the Dravya should be fine powder.

आदाय शुष्क द्रव्यं व स्वरसानाम सम्भवे ।
जलेऽष्टगुणिते साध्यं पादशिष्टं च गृह्यते ॥
(Sha. Ma. 1/4)

When drug is very dry and obtaining Swarasa from it is very tedious then in this condition the drug is soaked into 8 times of water and then it is boiled over Agni. When one fourth is remained then it is filtered and used as Swarasa.

Note- Here two alternative methods for the preparation of Swarasa is given. In one method there is no application of heat while the second involves the application of heat.

3. Putapaka Swarasa

Definition-Putapaka Swarasa is defined as the method in which Swarasa is obtained after doing Paka in Agni.

पुटपाकस्य कल्कस्य स्वरसो गृह्यते यतः ।
अतस्तु पुटपाकानां युक्तिरत्रोच्यते मया ॥
(Sha. Madh. 1/21)

In Putapaka, Swarasa is obtained from Kalka of Aushadhi so here the method of Putapaka is described.

Method of Preparation

पुटपाकस्य मात्रेयं लेपस्याङ्गारवर्णता ।
लेपं च द्वयङ्गुलं स्थूलं कुर्याद्वाङ्गुष्ठमात्रकम् ॥
काश्मरीवटजम्ब्वादि पत्रैर्वेष्टनमुत्तमम् ।
(Sha. Mad. 1/22-23)

The drug, of which Putapaka Swarasa is to be obtained, is made into Kalka form. Then this Kalka is placed on leave of any one like Kashmari, Vata or Jambu etc. and then it is tied with thread. After that Lepa of wheat having thickness equal to Angushtha is wrapped over it and after Lepa of Mrittika (Soil) having thickness of 2 Angula is wrapped over it and dried well. Now it is placed in fire till then outer covering of it becomes Angar Varna (Red coloured). Now it is taken out from fire and all the coverings are removed and Kalka is placed in the cloth and by pressing Kalka the Putapaka Swarasa is obtained.

Note- Here in the process 3 coverings are

wrapped over Kalka before subjecting it into heat.

1. First by the leaves of Vata, Kashmari etc.
2. Lepa of wheat leaves of Vata, Kashmari etc.
3. By Lepa of Mrittika having thickness of 2 Angula.

Pressing should be done in hot condition with proper precaution to obtain Swarasa.

Vasa Putapaka Swarasa

पिष्टानां वृषपत्राणां पुटपाकरसो हिमः।
मधुयुक्तो जयेद्रक्तपित्तकास ज्वरक्षयान्॥
(Sha. Madh. 1/34)

Ingredients- Fresh leaves of Vasa

Instruments/Equipment's- Vata Patra, Kashmari or Jambu Patra, thread for tieding leaves containing Kalka, mortar pestle, wheat powder, soil, cloth bowl, measuring flask, spoon cow dung cakes for heating.

Method of preparation- Vasa leaves are washed with potable water is kept in Mortar and Kalka is made with the help of pestle. Now this Kalka is placed over leaf of Vata Kashmari or Jambu. Now it is tied with therad. Lepa of wheat as well as soil in smeared over it and dried well. Now it is subjected to fire of Uplas (12-14 in numbers). When it becomes red hot then it is taken out from fire and all coverings are removed. Now Kalka is placed over cloth are by applying pressure Putapaka Swarasa of Vasa is obtained.

Dose- One Pala

Use- It is used with honey in Rakta pitta, Jwara, Kshaya.

Modern aspect

Various types of juices like Amalaki juice, Aloe vera juice, Jamuna Swarasa etc and fruit juices like apple, mango, orange etc are available in the market. These are prepared either by maceration process or by pressing method. In these methods neither heat nor any solvent is used. After obtaining juices these are filtered and it is pasteurised and packed in suitable packing material.

Expressed juice- Expressed juice is defined as fluid extract from fresh plants used to create a mother tincture.

Kalka Kalpana

Kalka comes after Swarasa in relation to parameter of Guruta. It is used by oral, nasal (as Avapeeda Nasya) route etc. It is defined by Acharya Charaka as follows.

यः पिण्डा रसपिष्टानां स कल्कः परिकीर्तितः॥
(Cha. Sutra. 4)

Kalka is the fine paste of macerated fresh plant material.

According to Vriddha Vagbhata

उपलदशनादि पिष्टस्तु कल्कः।
(As. Sang. Kalp. 8/10)

Kalka is that dosage form that is prepared after being ground with stone, teeth etc.

यतो यद् द्रव्य द्रवेण सिक्तं पिण्ड भवति न तु विलीयते तत् कल्क संज्ञामासादयति।
(Arundutta on As. M. Kalp. 6/8)

When any Dravya is ground after welting it then it becomes Pinda form and is not dissolved in this liquid then it is termed as Kalka.

According to Aacharya Sharangadhara

द्रव्यमार्द्रं शिलापिष्टं शुष्कं वा सजलं भवेत्।
प्रक्षेपावापकल्कास्ते तन्मानं कर्षसंमितम्॥
(Sha. Madh. 5/1)

The Dravya whether fresh or dry it is ground with help of water and make into paste form. It is known as Kalka.

Synonym- Prakshepaka and Avapa are synonyms to Kalka.

Principle involved- Peshana

Instruments used in small scale production- Mixer/ mortar and pestle of stone

Large scale production- Automated sauce making machine

Siddhi Lakshana-Paste like consistency having Gandha, Varna and Rasa of drug,

Storage-Kalka should be used in fresh condition.

Shelf Life- Kalka should be used in fresh condition

Nimba Kalka

लेपान्निम्बदलैः कल्को व्रणशोधनरोपणः।
भक्षणाच्छर्दि कुष्ठानि पित्तश्लेष्मकृमीञ्जयेत्॥
(Sha. Madhu. 5/6)

Ingredients- 1. Fresh Nimba leaves

Instruments/Equipment's- Stone mortar and pestle, Spoon, Plate

Method of preparation- Nimba leaves are washed with potable water, now these are kept over stone mortar and a little amount of water is added so it, with the help of pestle it is made in to Pinda (Paste) form.

Use- Used as Vrana Shodhana and Ropana. When it is ingested, it pacifies Chardi, Kushtha, Pitta, Kapha Krimi.

Rasona Kalpa

शुद्धःकल्को रसोनस्य तिलतैलेन मिश्रितः।
वात रोगाञ्जयेत्तीव्रान्विषमज्वर नाशनः॥
(Sha. Madhu. 5/7)

Ingredients- Nishtusha Rasona

Instruments /equipment's- Stone mortar and pestle, spoon, knife.

Method of preparation- Rasona are made into Pinda form with the help of mortar and pestle. Takra is used for the Shodhana (Gandha Nasha) of Rasona.

Uses- It is used in Vata Roga with Tila Taila. It also acts as Vishana Jwara Nashaka.

Modern Aspect of Kalka- Sauce or Ketch can considered as Kalka of modern time.

Kwatha Kalpana

Kwatha Kalpana, amongst all five Kashaya Kalpana, is largely practised dosage form in today's busy life style. In fact, it is only Kalpana which is in general practice in OPD & IPD while the other four are used in limited way. Aacharya Charaka has used Kwatha Kalpana for treatment of Jwara, Raktapitta, Prameha, Kushtha, Panda etc. Kwatha is used for the preparation of different dosage form like Avaleha, Asava Sneha etc. In general, the liquid, that is obtained by boiling it into water, is known as Kwatha.

Definition of Kwatha

बह्वौ तु क्वथितं द्रव्यं श्रृतमाहुश्चिकित्सकाः।
(Cha. Su. 4/25)

Kwatha is the filtered decoction obtained by boiling of Dravya into water.

क्वाथः क्वथितः कषायः।
(Adhamalla on Sha. Madh. 1/1)

Kwatha is boiled Kashaya.

Method of preparation of Kwatha

पानीयं षोडशगुणं क्षुण्णे द्रव्यपले क्षिपेत्।
मृत्पात्रे क्वाथयेद्ताह्यमष्टमांशवशेषितम्॥
तज्जलं पाययेद्धीमानकोष्णं मृद्वाग्निसाधितम्।
श्रृतः क्वाथः कषायश्र् निर्मूहः स निगद्यते॥
(Sha. Madh. 2/1-2)

One Pala of Yavakuta Aushadhi is taken into an earthen vessel and 16 times of water is added to it. Now it is boiled over Mridu Agni till 1/8 of water of its initial quantity is left. It is then filtered and obtained liquid is known as Kwatha.

Synonym of Kwatha- Shrita, Kashaya and Niryuha are synonyms to Kwatha.

Note- Niryasa is synonym for Swarasa while Niryuha is to that Kwatha.

Special precaution during preparation

अपिधानमुखे पात्रे जलं दुर्जरतां व्रजेत्।
तस्मादावरणं त्यक्त्वा क्वाथादीनां विनिश्चयः॥
(Sha. Madh. 2/7)

When vessel is covered with a lid then water does not reduce easily. So, during heating vessel should not be covered.

Types of Kwatha

In the Harita six or seven types of Kwatha is described.

क्वाथः षष्ठविधः प्रोक्तः पाचनः शमनस्तथा।
दीपनः क्लेदनः शोषी सन्तर्पणो विशेषतः॥
(Harita. 3rd Sthana. 1/41)

Pachana, Shamana, Deepana, Kledana, Shashi and Santarpana these are six types of Kwatha.

पाचनो दीपनीयश्च शोधनः शमनस्तथा।
तर्पणः क्लेदनः शोषी क्वाथः सप्तविधः स्मृतः॥
(Harita. 3rd sthan. 1/47)

Pachana, Deepaniya, Shodhana, Shamana, Tarpana, Kledana and Shoshi are seven types of Kwatha.

Characteristic and functions of seven types of Kwatha

पाचनोऽर्द्धावशेषी स्याच्छोधनो द्वादशांशकः।
क्लेदनश्चतुरङ्गश्च शमनोऽष्टावशेषितः॥
दीपनीयो दशांशास्तु तर्पणश्च समाशंकः।
विशोषी षोडशांशश्च क्वाथभेदाः प्रकीर्त्तिताः॥
(Harita. 3rd sthan. 1/48-49)

Sr. No.	Kwatha type	Character	Function
1.	Pachana	1/2 amount of water is left	Dosha Pachana
2.	Deepana	1/10 of water is left	Agni Deepana
3.	Shodhana	1/12 of water remains	Mala Shodhi
4.	Shamana	1/8 of water remains	Roga Shamana
5.	Tarpana	Only boiling is done	Dhatu Tarpana
6.	Kledana	1/4 of water remains	Kledakarata for Hridaya
7.	Shoshana	1/16 of water remains	Shoshoka

Principle involved- Boiling/ Toya Agni Sannikarsha

Instruments used in small scale production- Stainless steel vessel, Heating device

Large scale production-Kwatha production on industry scale for the production of Kwatha on large scale steam jacketed kettle is used which is a hemispheric structure with an inner pan called kettle enclosed with an outer pan called jacket. Kettle and jacket join together to enclose an air space into which steam is applied to pass to the extract placed in kettle.

The aqueous extract to be evaporated is placed in the pan and steam is introduced through the inlet. Condensation occurs on the outer surface of the pan and the condensation exists through the outlet. Steam supply heat to the contents of pan. The kettle is either kept fixed or is tiled while collecting the products steam jacketed kettle is used for concentrating aqueous and thermostable liquors.

Siddhi Lakshana- Liquid having Gandha, Varna and Rasa of drug.

Storage- Kwatha should be used in fresh condition. Kwatha Churna can be stored in air tight containers. Prepared Kwatha can stored as Pravahi Kwath in glass or food grade plastic bottle.

Shelf life- Kwatha Churna- 1 year and Prawahi Kwatha- 3 years

Rasana Saptaka Kwatha

रास्ना गोक्षुरकैरण्डदेवदारु पुनर्नवा।
गुडूच्यारावधश्चैव क्वाथमेषां विपाचयेत्॥
शुण्ठी चूर्णेन संयुक्तं पिबेज्जङ्घाकटिग्रहे।
पार्श्वपृष्ठोरूपीडायामामवाते सुदुस्तरे॥
(Sha. Madh. 2/86-87)

Ingredients :

1. Rasna
2. Gokshura
3. Eranda
4. Devdaru
5. Punarnava
6. Guduchi
7. Aragavadha

All Dravya should be taken in equal quantity in Yavakuta form and water for boiling.

Instruments/Equipment's- Mortar pestle or disintegrate for size reduction. Stainless steel vessel, laddle, cotton cloth, measuring flask, heating device.

Method of preparation- Yavakuta Churna of all seven drugs is taken in stainless steel vessel and sixteen times of water is added to it. Boiled is done

over mild heat till one eight water remains. Now it is filtered and used in lukewarm condition.

Therapeutic uses- Jangha Katigraha, Parshva Prishtha Urupida, Aanvata. Before administration Shunthi power is added to it.

Dose- 2 Pala (Madhyam Matra)

Punarnavashtaka Kwatha

पुनर्नवाभयानिम्बदार्वीत्तिक्तापटोलकैः ।
गुडूचीनागरयुतैः क्वाथो गोमूत्र संयुतः ।
पाण्डुकासोदरश्वासशूल सर्वाङ्गशोथहा ॥
(Sha. Madh. 2/76-77)

Ingredients-

1. Punarnava
2. Abhaya
3. Nimba
4. Daruharidra
5. Tikta (Kutaki)
6. Patola Patra
7. Guduchi
8. Shunthi

All the ingredients are taken in equal ratio

Water- Sixteen times to total amount of raw drug.

Instruments/Equipment's- Mortar pestle/ Disintegration, stainless steel vessel, ladle, cotton cloth, heating device.

Method of preparation- All the drugs are made in Yavakuta form and kept in stainless steel vessel. Now water is added to it. Boiling is done by applying heat. When 1/8 quantity of water is left then heating is stopped and it is filtered through cotton cloth. It is used in lukewarm condition.

Therapeutic uses- It is used in Pandu, Kasa, Shwasa, Udar Roga, Shula and Sarvanga Shotha.

Before administering Gomutra is mixed into it.

Kulattha Kwatha

कुडवकुलत्थक्वथितं पायः कोष्ण विशिष्य निष्पीतम् ।
शीतज्वरं विजयते रेकं वान्तिमुद्भाव्य ॥
(Siddha Bheshaja Mani mala IV Guchchha/26)

Ingredients-

1. Kulattha lenticle - 1 Part
2. Water - 8 times

Instruments/equipment's- Mortar and pestle, stainless steel vessel, ladle, cotton cloth, heating device.

Method of preparation- Kulattha lenticels are made into coarse powder. Now it is put into stainless steel vessel and desired quantity of water is added to it. When one fourth quantity is left then heating is stopped and filtered through cotton cloth.

Therapeutic uses- Sheeta Jwara, Rechana, Vaman.

Hima Kalpana

Definition

शीतो रात्रि द्रवे स्थिता । (Ash. Hrid. Kalp. 6/10)

यत् द्रव्यं द्रवे सकलां रात्रिं स कल्पना कषायः शीत इत्युच्यते । (Arun Datta on above verse)

Dravya is dipped into Drava (liquid) and left for overnight. On next day it is filtered. The obtained liquid is known as Hima.

Method of Preparation

क्षुण्णं द्रव्यपलं सम्यक् षड्भिर्नीरपलैः प्लुतम् ।
निशोषितं हिमः स स्यात्तथा शीतकषायकः ॥
तन्मानं फाण्टवज्ज्ञेयं सर्वत्रैवैष निश्चयः ॥
(Sha.Madh. 4/1-2)

One Pala of Dravya is dipped into six Pala of water after that it is left for overnight. On the next day it is filtered and the obtained liquid is known as Hima.

Sheeta Kashaya is synonym used for Hima.

Note- In the Hima Kalpana water is taken as solvent but here for the preparation heat is not applied. Drugs having volatile substances Hima Kalpana is prepared. If Hima Kalpana is to be prepared in summer or humid days then the place where it is kept should be proper ventilated otherwise it will be spoil.

Adhamalla has commented on the word Kshunna as follows :

क्षुण्णे द्रव्यपले इति सम्यक क्षुण्णे अत्यन्त कुट्टिते, चूर्ण सदृश इत्यर्थः।

That is Dravya should be in Churna Rupa.

Principal-Toya Sannikarsha

Instruments used in small scale and large-scale production- Hima can br prepared by using big or small sized stainless-steel vessel according to need.

Siddhi Lakshana- Liquid having Gandha, Varna and Rasa of dominant drug.

Storage-Hima should be used in fresh condition.

Shelf life-Should be used in fresh condition

Dhanyaka Hima

प्रातः सशर्करः पेयो हिम धान्यक संभवः।
अन्तर्दाहं तथा तृष्णा जयेत्स्त्रोतोविशोधनः॥
(Sha. Madh. 4/7)

Ingredients-

1. Dhanyaka	-	1 Part
2. Water	-	6 Parts
3. Sharkara	-	For Prakshepa

Instruments/Equipment's- Mortar and pestle, stainless steel vessel, cloth or sieve, ladle, spoon.

Method of preparation- Dhanayaka is made into coarse or Churna form. Then it is taken into stainless steel vessel and six times of water is added to it and left for overnight. On next day it is filtered.

Therapeutic uses- It is used with Sharkara in Antardaha, Trishna, Srotoshodhana.

Sarivadi Hima

Reference- Siddha Yoga Samgraha

Ingredients-

1. Anantmoola	2. Gula Vanapsa
3. Khadira	4. Amalaki
5. Brahmi	6. Neelkanthi
7. Chopachini	8. Manjishtha
9. Guduchi	10. Dhamasa
11. Rakta Chandana	12. Khasa
13. Gorabha Mundi	14. Shahatara
15. Lotus flower	16. Rose flower
17. Guma	18. Padmakha
19. Jivantimula	20. Shankha hali

All drugs should be taken in equal parts.

Water- 6 times

Instruments/Equipment's- Mortar, Pestle, Stainless stell vessel, cotton cloth spoon.

Method of preparation- All twenty drugs should be mixed and made into Yavaputa form. Now is kept into vessel and six times of water is added to it and left for overnight. Next day it is filtered and used.

Therapeutic uses- All types of Rakta Vikar, Pama, Kandu etc.

Phanta Kalpana

Definition-The Phanta is the infusion obtained by pouring hot water on the powdered drug and strained when cooled. (A.F.I. Part I page- 353)

Method of Preparation

क्षुण्णे द्रव्यपले सम्यग्जलमुष्णं विनिक्षिपेत्।
मृत्पात्रे कुडवोन्मानं ततस्तु स्त्रावयेत् पटात्॥
तस्य चूर्ण द्रवः फाण्टस्तन्मानं द्विपलोन्मितम्।
सितामधुगुडादींश्च क्वाथवत्तत्र निक्षिपेत्॥
(Sha. Madh. 3/1-2)

1 Pala of Kshunne drug (Powdered drug) taken into an earthen pot. Then 4 Pala of hot water is poured. Now it is filtered by cloth. The obtained liquid is known as Phanta.

Synonym- Churna Drava.

Note- Here for the Jala 'सम्यक् जलमुष्ण' term is used.

For how many times after adding water it should be filtered?

उष्णामित्यर्ध विशोषितंम क्वथित मात्रमिति चित्त।
(Adhamalla)

Here Ushna is indicative of 1/2 quantity of water is reduced then this water should be used for preparation. In other opinion only boiled water is used.

According to Ayurvedic formula of India- When water becomes cooled then it is filtered. According to Adhamalla after addition of water it

should be churned with drug very well then it should be filtered. Because Churna of Dravya is used so it is known as Churna Drava.

Principal-Toya Agni Sannikarsha

Instruments used in small scale and large-scale production- Phanta can be prepared by using big or small sized stainless steel vessel according to need.

Siddhi Lakshana- Liquid having Gandha, Varna and Rasa of dominant drug.

Storage-Phanta should be used in fresh condition.

Shelf life-Should be used in fresh condition.

Panchakola Phanta

Ingredients-

1. Pippali
2. Pippalimula
3. Chavya
4. Chitraka
5. Chavya- All drugs should be taken in equal amount.
6. Water - 4 times

Instruments/Equipment's- Mortar pestle, Stainless stell vessel, Cotton cloth, Spoon.

Method of preparation- All drug one made into Churna form with mortar and pestle. Then boiled or half redneed water is added to it. Now it is mixed well when it becomes cool then it is strained through cotton cloth and used.

Therapeutic uses- It is used as antipyretic, analgesic, anti-inflammatory, appetizer, digestive, and carminative.

Madhuyashti Phanta

Ingredients-

1. Madhuyashti-1 Part
2. Water (Hot) - 4 Part

Instruments/Equipment's- Mortar and pestle, stainless steel vessel, cotton cloth spoon.

Method of preparation- Churna of Madhuyashti is prepared than 4 times of hot water (as explained above) is added to it and mixed well. Now it is filtered through cotton cloth when it becomes cool. The obtained liquid is Phanta of Madhuyashti.

Therapeutic uses- Laxative and emetic

Modern aspect of Kwatha/ Hima/ Phanta

Now-a-days. Kwatha is compared with decoction, Phanta as hot and Hima as cold infusion. Kwatha, Hima and Phanta are drug extraction process described in Ayurveda where water is used as solvent. The obtained liquid contains water soluble extracts and may contain alkaloid, tannins etc. These compounds are therapeutically active and when administered they provide therapeutic efficacy resulting into cure of diseases. In modern science the extraction is defined as follows.

Extraction can be defined as the removal of soluble active material from the insoluble residue like cell tissue by treatment with a liquid solvent.

The solvent used for extraction is known as Menstruum and the inert insoluble material that remain after extraction is called Marc. In the various extraction process water, alcohol, ether, chloroform etc. are used as Menstruum.

Various types of extraction are as follows-

1. Infusion
2. Decoction
3. Digestion
4. Maceration
5. Percolation

1. **Infusion**- In this process cold or boiling water is used. Drugs used in this process are soft or may contain volatile oils. Drug and menstruum are kept for a fixed time. It can be shake from time to time. After that it is filtered.
2. **Decoction**- This method is used for hard and woody drugs. Drug is boiled in water for a fixed time and then it is filtered.
3. **Digestion**- In this process drug is heated for long time on a certain pressure and low temperature.

4. **Maceration-** In this method drug and menstruum are kept in a closed vessel for seven days. After that it is filtered. After that it is filtered. After that Marc is pressed and filtered obtained both of liquid is mixed.
5. **Percolation-** Generally Tinctures are prepared by this process. In this method drugs and menstruum are packed in percolator. Menstruum moves downwards through the effect of gravity. In this process drug is used in powder form.

Churna Kalpana

Definition

चूर्ण शुष्क पेषणाणूकृतावयवैः । (Dalhana)

Fine solid particles obtained after grinding of dry drug is known as Churna.

अत्यन्त शुष्कं यद्द्व्यं सुपिष्टं वस्त्रगालितम् ।
तत्स्याच्चूर्ण रजः क्षोदस्तन्मात्रा कर्षसंमिता ॥
(Sha. Mad. 6/1)

When extremely dried drugs is ground well and then it is screen through cloth the material which is obtained is known as Churna. The drug should be complete dry in sun rays.

General method of preparation- Drugs mentioned in the formulation are cleaned and dried properly. These are finely powdered and sieved where there are a number of drugs in a formulation the drugs are separately powdered and sieved. Each one of these is weight separately and well mixed together. As some of the drug contains more fibrous matter than others, this method of powdering and weighting these separately, according to the formulation, and then mixing these together is preferred.

In industry, however, all the drugs are cleaned, dried and powdered together by disintegrators. Mechanical shifters are used for screening. Salt, sugar camphor etc. when mentioned are separately powdered and mixed with the rest at the end. Hingu and salt may also be roasted powdered and then added. (A.F.I p 103 part I)

Synonyms- Raja and Kshoda are synonyms of Churna.

Principle involved- Peshana and Galana

Instruments used in small production- Ulukhala Yantra

Large scale production- Pulveriser, Disintegrator, Shifter

Siddhi Lakshana-The powder is fine of at least 80 mesh sieves. It should not adhere together or become moist.

Storage- Churna should be kept in air tight containers.

Shelf-life- 2 years

Sitopaladi Churna

सितोपला षोडश स्यादष्टौ स्याद्वाश रोचना ॥
पिप्पली स्याच्चतुष्कर्षा स्यादेला च द्विकार्षिकी ।
एकः कर्षस्त्वचः कार्यश्चूर्णयेत्सर्वमेकतः ॥
सितोपलादिकं चूर्णं मधुसर्पिर्युतं लिहेत् ।
श्वासकासक्षयहरं हस्तपादाङ्गदाहजित् ॥
मन्दाग्निं सुप्त जिह्वत्वं पार्श्वशूलमरोचकम् ।
ज्वरमूर्ध्वगतं रक्तं पित्तमाशु व्यपोहति ॥
(Sha.Madh. 6/134-137)

Ingredients-

1. Sita-16 Karsha
2. Vamslochana-08 Karsha
3. Pippali-04 Karsha
4. Ela-02 Karsha
5. Twaka-01 Karsha

Instruments/Equipment's- Mortar pestle or Disintegrator, sieve

Method of preparation- All of the should be powdered separately and weighed. Now these are mixed in quantity indicated in the formulation and mixed well.

Sahapana- Ghrita and Honey

Therapeutic uses- Shwasa, Kasa, Kshaya, Hasta Pada Daha, Anga Daha, Mandagni, Supta Jihwa, Parshwa Shoola, Arochaka, Jwara, Urdhvagata Rakta Pitta.

Dose- 1 to 3 grams.(A.F.I.)

Note- About eighteen references of Sitopaladi Churna is found from Charaka Samhita to Ayurvedic formulary of India. Ashtanga Hridaya has used Mishri in place of Sita. In some context ''Bahula'' term is given. Adhamalla has said that from Bahula, Kshudra Ela (small Ela) is taken.

Hinguwashtaka Churna

त्रिकटुकमजमोदा सैन्धवं जीरके द्वे।
समधरण धृतानामष्टमो हिङ्गुभागः॥
प्रथमकवलयुक्तं सर्पिषश्चूर्णमेत ज्जनयति।
जठराग्नि वातरोगांश्च हन्ति॥

(B.R. Agnimandya 59)

Ingredients-

1. Shunthi - 3 gm
2. Maricha - 3 gm
3. Pippali - 3 gm
4. Ajmoda - 3 gm
5. Saindhava Lavana - 3 gm
6. Shweta Jeeraka - 3 gm
7. Kala Jeeraka - 3 gm
8. Shuddha Hingu - 3 gm

(The amount is taken from Ayurvedic formulary of India)

For Shodhana of Hingu it is fried well in Ghee.

Instruments/Equipment's- Mortar, Pestle, Disintegration, Sieve.

Method of preparation- Ingredients from 1 to 7 are made into powder form. After that Shodhita Hingu is mixed with some amount of Churna and grind well. Now it is mixed with the rest of the Churna.

Therapeutic use- Agnimandya, Vata Roga

Method of administration- Should be taken only with Prathama Kavala with Ghrita.

Dose- 1 to 3 gm

Lavana Bhaskar Churna

सामुद्रलवणं कार्यमष्टकर्षमितं बुधैः।
पञ्च सौवर्चलं ग्राह्यं बिडं सैन्धव धान्यकात्॥
पिप्पली पिप्पलीमूलं कृष्णजीरक पत्रकम्।
नागकेशर तालीसमम्लवेतसकं तथा॥
द्विकर्षमात्राण्येतानि प्रत्येकं कारयेद्बुधः।
मरिचं जीरकं विश्वमेकैकं कर्षमात्रकम्॥
दाडिमं स्याच्चतुष्कर्ष त्वगेले चार्धकार्षिके।
एतच्चूर्णीकृतं सर्व लवणं भास्कराभिधम्॥
शाण प्रमाण देयं तु मस्तुतक्र सुरासवैः।
वातश्लेष्मभवं गुल्म प्लीहानमुदरं क्षयम्॥
अर्शांसि ग्रहणीं कुष्ठं विबन्ध च भगन्दरम्।
शोफं शूलं श्वासकासावामवातं च हृद्रुजम्॥
मन्दाग्निं नाशयेदेतद्दीपनं पाचनं परम्।
सर्वलोकहितार्थाय भास्करेणोदितं पुरा॥

(Sha. Math. 7/139-144)

Ingredients-

1. Samudra Lavana - 8 Tola
2. Sauvarchala Lavana - 5 Tola
3. Vida Lavana - 2 Tola
4. Saindhava Lavana - 2 Tola
5. Dhanayaka - 2 Tola
6. Pippali - 2 Tola
7. Pippalimula - 2 Tola
8. Krishna Jeeraka - 2 Tola
9. Nagakeshara - 2 Tola
10. Taalisa Patra - 2 Tola
11. Amalvetasa - 2 Tola
12. Tejapatra - 2 Tola
13. Kali Maricha - 1 Tola
14. Shweta Jeera - 1 Tola
15. Shunthi - 1 Tola
16. Dadima - 1 Tola
17. Dalchini - 1/2 Tola
18. Small Ela - 1/2 Tola

Instruments/Equipments- Mortar pestle, Disintigrator, sieve

Method of preparation- All of the ingredients are commuted well and screered.

Dose- 3 gm

Anupana- Mastu, Takra, Sura, Aasava

Therapeutic uses- Arsha, Grahani, Mandagni,

Vata Kapaja Gulma, Pleeha Udara, Kushtha, Vivandha, Bhagandara, Shopha, Shoola, Shwasa, Kasa, Aamvata, Hridroga, It acts as Deepana and Pachana.

Powder

Powder as a dosage form represents a formulation that is a mixture of powdered drug and excipients. It is one of the most conventional dosage form. Due to development of new dosage form like tablet, capsule the use of powder as dosage form (which is taken internally) has declined. Powders are used internally as well as externally. Depending upon its specific purpose the powder are of following categories.

1. Fine powder- meant for internal intake
2. Dusting or body powder- application on skin
3. Dentifrices- tooth powder
4. Parenteral powder- powder for dissolution into vehicles before use as injection
5. Insufflation- meant for nasal tract, ear, vagina etc.

Depending upon composition powder can be of simple or compound. When it is only one component then it is known as simple powder. When it is composed of more than one drug then it is known as compound powder.

In the manufacturing of powder the following process are involved :

1. Size reduction- It is process by which reduction of materials to smaller pieces, to coarse particles or to powder takes place. The word communication is also indicative of the process that breaks large solid particle into small particles of appropriate size. The common methods of size reduction are as follows.

(a) **Cutting-** The material is cut by means of sharp blades. For example cutter mill.

(b) **Compression-** The material is compressed between heavy rollers made up of stone or metal. For example-Roller mill.

(c) **Attrition-** Material is break down by rubbing action between tow surfaces. For example fluid energy mill.

(d) **Impact-** In this process materials is stationary and it is hit by moving hammers at high spped. Example is hammer mill.

Here different mill, its work etc. are given :

Sr. No.	Mill	Action	Product size	Used for
1.	Cutter mill	Cutting	20 to 80 Mesh	Crudi animal and vegetable drugs
2.	Edge runner	Crushing	20 to 80 Mesh	All most all drugs
3.	Roller mill	Compression	20 to 200 Mesh	Soft material
4.	Hammer mill	Impact	4 to 325 mesh	All most all drugs

Factors affecting size reduction-

1. Hardness
2. Toughness
3. Abrasiveness
4. Stickiness
5. Moisture content
6. Material content
7. Softening temperature

2. Size Separation- It is the process that involves the separation of a mixture of varrying sizes of particles into two or more part by means of screening surfaces. This is because the obtained powder is not composed of uniform particles but it is composed of different particle size. Various terms used for size separation are sieving, sifting, or classifying. Particle can be separated into individual sizes using different types of sieves. The material which is on the screening surface after sieving is known as over size or plus material and that material which passes through screening surface is known as minus material or undersize.

Grades of powders and sieve number as per IP

Sr. No.	Grade of powder	Sieve through which all particles must pass	Nominal mesh aperture size	Sieve through which not more than 40% of particle pass
01	Coarse	10	1.7 mm	44
02	Moderately coarse	22	710 mm	60
03	Moderately fine	44	355 mm	85
04	Fine	85	180 mm	Not specified
05	Very fine	120	125 mm	Not specified

The number of the sieve indicating the number of meshes included in a length of 25.4 mm in each direction parallel to the wires. Thus a No. 22 sieve has 22 meshes per 25.4 mm in each direction.

Standards for sieves - It is as follows:

1. Number of sieve
2. Nominal size of aperture
3. Nominal diameter of the wire
4. Approximate screening area
5. Aperture tolerance average

Size separation is based upon three methods:

1. Agitation
2. Brushing
3. Centrifugal force

Pramathya

Definition- Pramathya is special Kwatha having Deepana, Pachana property. It is used in Atisara when Doshas are in Madhyavastha. According to Charaka.

प्रमथ्यां मध्यदोषाणां दद्याद्दीपनपाचनीम् ।
(Cha. Chi. 19/19)

संज्ञा प्रमथ्या ज्ञातव्या योगे दीपनपाचने ॥
(Chakrapani Atisara Chikitsa 25)

श्रृतः कषायो निर्यूहः क्वाथो यूषोऽकृतश्च सः ।
कृतयूषः प्रमथ्या च द्रव्यात्कल्कीकृताच्छृतः ॥
(Arundutta on As. Hri. Chi. 9/5)

For the above description it is cleared that Pramathya is a special type of Kwatha in which first drug is made into Kalka form. Then Kwatha is prepared by using this Kalka.

Method of Preparation

प्रमथ्या प्रोच्यते द्रव्यपलात्कल्कीकृताच्छृतात् ।
तोयेऽष्टगुणिते तस्याः पानमाहुः पलद्वयम् ॥
(Sha. Madh. 2/150)

One Pala of Dravya is made into Kalka form. To this Kalka 8 times of water is added and when 2 Pala of water is left then after filtering it is used.

The dose of Pramathya is 2 Pala

Principle involved- Toya Agni Sannikarsha

Instruments used in small and large scale production- It can be prepared by using big or small sized stainless steel vessel according to need.

Siddhi Lakshana- Liquid having Gandha, Varna and Rasa of dominant drug.

Storage- It should be used in fresh condition.

Shelflife-Should be used in fresh condition

Difference between Kwatha and Pramathya

Sr. No.	Kwatha	Pramathya
1.	Drug is used in Yavakuta form	Drug is in Kalka form
2.	Used in all Dosha	Used in Madhya vastha
3.	Used as Shodhana Shamana etc.	Used as Only Deepana, Pachana

Mustadi Pramathya

मुस्तकेन्द्रयवैः सिद्धा प्रमथ्या द्विपलोन्मिता ।
सुशीता मधुसंयुक्ता रक्तातीसारनाशिनी ॥
(Sha. Madh. 2/1510)

Ingredients-

1. Musta
2. Indrayava both in equal quantity/water - 8 times (to mixed quantity of both drugs)

Instruments/Equipment's- Mortar, Pestle, stainless steel vessel, cotton cloth, ladle, heating device.

Method of preparation- Both of drugs are made into Kalka form. It is not kept in stainless steel vessel and eight times of water is added to it. Now it is boiled till 2 Pala of water remains. Now it is filtered when it becomes cool then after mixing honey it is used.

Therapeutic uses- Raktatisara

Aushdha Siddha Paniya

Aushadha Siddha Paniya is prepared by following the definition of Jala Samskar instead of Kwatha Paribhasha. It is given by Chakrapani on the verse Cha. Chi. 3/145 as follows.

यदप्सुशृतशीतासु षडङ्गादि प्रयुज्यते।
कर्षमात्रं ततो द्रव्यं साधयेत् प्रास्थिकेऽम्भसि॥
अर्धशृतं प्रयोक्तव्यं पाने पेयादि संविधौ।

One Karsha of Dravya is soaked into one Prastha (64 times) of water and it is boiled till half of the water remain left. Now this water is used to drink and preparing Peya etc.

According to Sharangadhara Acharya

क्षुण्णं द्रव्यपलं साध्यं चतुःषष्टि पले जले।
अर्द्धशिष्टं च तद्देयं पाने भक्तादि संविधौ॥
(Sha.Madh. 2/157)

One Pala of Yavakuta Dravya is taken and sixty four times of water is added when half of the amount of water is left then it is used as Pana (in Shadangapaniya) as well as for the Yusha, Rasa and Yavagu preparation.

Principle involved- Toya Agni Sannikarsha

Instruments used in small and large scale production- can be prepared by using big or small sized stainless steel vessel according to need.

Siddhi Lakshana- Liquid having Gandha, Varna and Rasa of dominant drug.

Storage- It should be used in fresh condition.

Shelflife-Should be used in fresh condition

Shadangpaniya

मुस्तपर्पटकोशीर चन्दनोदीच्यनागरैः।
शृतशीतं जलं दद्यात् पिपासाज्वर शान्तये॥
(Cha.Chi. 3/145)

Ingredients-

1. Musta
2. Parpata
3. Ushana
4. Chandana
5. Sugandhabala
6. Shunthi

All of the drugs should be taken in equal quantity.

Water- 64 times to the weight of all drug

Instruments/Equipment- Mortar & Pestle, Stainless steel vessel, Cotton cloth, Ladle, Heating device.

Method of preparation- All the six drugs are made into Yavakuta form and put into stainless steel vessel. Now water is added to it and boiled when half of the quantity of water is left then is filtered and used.

Therapeutic uses- Pipasa and Jwara

Ushnodaka

Definition - Boiled water is known as Ushnodaka.

Method of preparation

अष्टमेनांश शेषेण चतुर्थेनार्थ केन वा।
अथवा कवचेनैव सिद्धमुण्णोदकं वदेता॥

Water is boiled till it remains one eighth, or one fourth or half of its initial volume as it is only boiled. The water obtained is Ushnodaka.

Principle involved - Boiling

Instruments - At small scale it can be prepared with stainless steel vessel and LPG and burner as heating device. At large scale boiler may be used.

Siddhi Lakshana - Boiled water or reduced up to desired quantity.

Shelf life and Storage: should be used after preparation.

Ksheera Paka

Definition- Ksheera Paka is the dosage form in which Ksheera (milk), Drug and water is taken in a specific ratio and then it is boiled till Ksheera remain left. It is known as Ksheera Paka.

Ingredients-Three ingredients are needed for preparation of Ksheera Paka

1. Milk
2. Drug
3. Water

Method of preparation according to Vagbhata

क्षीरादि सहितं च द्रव्यं न सम्यङ्मुक्तरसं भवतीति वारिक्वाथ पूर्वकं क्षीराद्यैस्तदुपदेशे अनुपदग्धं क्वाथयेत् ।

(As.San.Kalp. 8/12)

According to Vagbhata when drug is boiled with Ksheera then the Rasa of drug do not transfer into milk. So, it is better that firstly Kwatha of drug is prepared by taking water and when Kwatha is prepared then it is added to milk that is milk and Kwatha are boiled in equal quantity of over mild heat so that it would not get burned. When only quantity of milk remains then it is used.

According to Sharangadhara

क्षीरमष्टगुणं द्रव्यात्क्षीरान्नीरं चतुर्गुणम् ।
क्षीरावशेषं तत्पीतं शूलमामोद्भवं जयेत् ॥

(Sha.Madh. 2/161)

Eight times of Ksheera to the amount of drug and four times of water from the quantity of Ksheera is taken altogether in a stainless-steel vessel and boiled. When only amount of Ksheera is left then it is taken from fire and used after filtering it.

According to Yadavji

क्षीरं तिथिगुणं द्रव्यात् क्षीरान्नीरं समं मतम् ।
क्षीरावशेषं कर्तव्यं क्षीरपाके त्वयं विधिः ॥

(Dra.Gun.Vig. Yadavji)

Ksheera is taken 15 times (Tithi = 15) to the amount of milk and water is taken in equal quantity to that of milk. All these are taken is a vessel and boiled till the quantity of milk remains. It is the method of preparing Ksheera Paka.

All of the three opinions are as follows :

Sr. No.	Aacharya	Davya	Ksheera	Jala	Reduced to
1.	Vagbhata	Kwatha of Dravya	Equal to Kwatha	-	Amount of Ksheera
2.	Sharang-adhara	1	8	32	Ksheera quantity
3.	Yadavji	1	15	15	Quantity of Ksheera

Principle involved- Toya Agni Sannikarsha

Instruments used in small and large scale production-can be prepared by using big or small sized stainless steel vessel according to need.

Siddhi Lakshana-Milk having Gandha, Varna and Rasa of dominant drug.

Storage- should be used in fresh condition.

Shelflife-Should be used in fresh condition

Rasona Ksheerpaka

साधयेच्छुष्क शुद्धस्य रसोनस्य चतुः पलम् ।
क्षीरोदकेऽष्टगुणिते क्षीरशेषञ्च पाययेत् ॥
वातगुल्ममुदावर्त्तं गृध्रसी विषम ज्वरम् ।
हृद्रोगं विद्रधिं शोषं नाशयत्याशु तत् पयः ॥

(Cha.Chi. 5/94-95)

Ingredients-

1. Rasona - 4 Pala
2. Ksheera- 16 Pala
3. Udaka - 16 Pala

Instruments/Equipment's- Stainless steel vessel, Mortar, Pestle, Cotton cloth, Heating devices.

Method of preparation- Rasona is crushed by mortar and pestle and then it is taken into vessel and Ksheerodaka is mixed and kept over fire. When only Ksheera is left then it is filtered and used.

Dose- 2 Pala or as required.

Therapeutic uses- Vata Gula, Udavarta, Gridrasi, Vishan Jwara, Hridroga, Vidradhi, Shosha.

Note- In the reference the term Ksheerodaka is written. From this word equal quantity of Ksheera and water is accepted.

Arujun Ksheerapaka

अर्जुनस्य त्वचा सिंद्ध क्षीरं योज्यं हृदामये।
(Chakra.Hri.Chi.-8)

Ingredients-

1. Arjuna Twak-1 Part
2. Ksheera-8 Parts
3. Water-32 Parts

Instruments/Equipment's- Mortar pestle, Stainless steel vessel, Cotton cloth, Heating device.

Method of preparation- Arjuna Twaka is made into Yavakut with help of mortar pestle. Now it is taken into vessel and milk along with water is added to it and it is kept over fire. When only amount of milk is left then it is taken out from fire. After filtering it is used.

Dose- As required

Therapeutic uses- Hrida Roga

Shunthi Ksheera Paka

सनागरं समृद्वीकं सघृतक्षौद्र शर्करम्।
श्रृतं पयः सखर्जूरं पिपासा ज्वरनाशनम्॥

Ingredients-

1. Shunthi
2. Ghrita
3. Draksha
4. Honey
5. Sharkara
6. Ksheera
7. Water

Instruments/Equipment's- Stainless steel vessel, Cotton cloth, Heating device.

Method of preparation- Shunthi and Draksha is taken into vessel along with Ksheera and water. Now it is kept over fire. When only milk remains it is filtered. After cooling Ghrita, honey and Sharkara are mixed.

Therapeutic uses- Pipasa, Jwara.

Laksha Rasa

Laksha Rasa is prepared with Lac which is the resinous secretion of a number of species of lac insects.

षडगुणेनाभ्भसा लाक्षां दोलायन्त्रे विपाचयेत्।
त्रिसप्तधा परिस्त्राव्या लाक्षारसमिमं विदुः॥
(Dravya Guna Vigyana Yadavji)

Laksha is kept into a Pottali. In an earthen pot six times of water is taken and this Pottali is dipped in the water and heat is provided. The obtained liquid is strained for twenty-one times. This liquid is known as Laksha Rasa.

According to Rasa Tantra Sara and Siddha Prayoga Samgraha Laksha is mixed with four times of water along with 1/10 part Lodhra, Sajji Kshara and few leaves of Zuzupus. After heating for some times Laksha Rasa is prepared.

Principle involved- Swedana

Instruments used in small and large scale production- Dola Yantra

Siddhi Lakshana- Red coloured liquid having Rasa and Gandha of Laksha

Storage- Should be used in fresh condition

Shelflife- Should be used in fresh

Mamsa Rasa

Definition - The liquid that is obtained when Mamsa and water are cooked boiled by taking these in a specific ratio.

Types - The consistency of Mamsa Rasa can be of three types according to quantity of Mamsa taken for cooking.

1. Ghana Mansa Rasa
2. Madhyam Mamsa Rasa
3. Tanu Mamsa Rasa

पलाष्टकं जले प्रस्थे धनेऽथ मध्यम तु षट्।
मांसस्य वण्टन कुर्यात् कुडवें तनुके रसे॥
(Dravya Guna Yadavji)

	Quantity of Mamsa	Water
1. Ghana Mamsa Rasa	8 Pala	64 Tola
2. Madhyama Mamsa Rasa	6 Pala	64 Tola
3. Tanu Mamsa Rasa	4 Pala	64 Tola

Method of Preparation

पाक पात्रे घृतं दद्यात्तैलञ्च तदभावत्।
तत्र हिंदु, हरिद्रा च भर्जयेत्तदनन्तरम्॥
हागादेशस्थ रहित मासं तत्खण्डित धुव।
धौत निर्णालित तस्मिन्धृते तदुर्जयेच्छनैः॥
सिद्धयोग्यं जलं दत्त्वा लवणन्तु पचेत्ततः।
सिद्धे जलेन सम्पिष्य बेसवार परिक्षिपेत्॥
(Bha Pra. Krittan. 80-82)

Ingredients-

1. Boneless flesh of goat
2. Ghrit / oil may be taken in absence.
3. Hingu
4. Haridra
5. Lavana
6. Water
7. Veshwara

Method of preparation- In a vessel Ghrita is taken and heated. Now Hingu and Haridra are fried in it. After that Mansa is added into it and fried well. When there are fried then water and Lavana is mixed into it as per need. Veshwara is added lastly. Now it is cooked well. The obtained liquid is known as Mamsa Rasa.

Principle involved - Toya Agni Sannikarsha.

Instrument used - Stainless steel Vessels and Heating device- Liquid having Gandha, Rasa, Varna of Mamsa.

Storage / Shelf Life - Should be used a fresh condition.

Mantha

Definition- To the Sattu (made of either Yava, Chanaka or Masoora) Ghrita is added after that Sheeta Jala is added in such quantity so its consistency remains neither too liquid nor to thick. It is known as Mantha.

Because this Kalpana is made by the process of Manthana (Churning) so it is named as Mantha. It's chief ingredient is Sattu. It is described by Aacharya Sushruta as follows-

सक्तवः सर्पिषाऽभ्यक्ताः शीतवारिपरिप्लुताः।
नातिद्रवा नातिसान्द्रा मन्थ इत्युपदिश्यते॥
(Su.Sutra. 46/385)

Acharya Charaka has used Sattu along with fruits like Kharjura, Mridwika, Dadima etc. for the preparation of Mantha. (Cha.Sut. 23/28).

Method of Preparation

मन्थोऽपि फाण्ट भेदः स्यात्तेन चात्रैव कथ्यते।
जले चतु : पले शीते क्षुण्णं द्रव्यपलं क्षिपेत्॥
मृत्पात्रे मन्थयेत्सम्यक्तस्माच्च द्विपलं पिबेत्।
(Sha. Madh. 3/9)

In an earthen pot one Pala of Aushadhi Churna is taken and four times of cold water is added to it. Now it is churned well. The prepared liquid is Mantha. It is a type of Phanta.

Dose- 2 Pala

Principle involved- Manthan

Instruments used in small and large scale production-can be prepared by using big or small sized stainless steel vessel according to need.

Siddhi Lakshana-Semi solid having Gandha, Varna and Rasa of dominant drug.

Storage-It should be used in fresh condition.

Shelflife-Should be used in fresh condition

Kharjuradi Mantha

खर्जूरदाडिमीद्राक्षातिन्तिडीकाम्लिकामलैः ।
सपरूषैः कृतो मन्थः सर्वमद्यविकारनुत्॥
(Sha.Madh. 3/10)

Ingredients-

1. Kharjoora
2. Dadima
3. Draksha
4. Tintidaka
5. Amlika
6. Aamalaki

7. Parushaka- All drugs should be taken in equal quantity.
8. Water - 4 times

Instrument/Equipment- Earthen pot or stainless-steel vessel, Stirrer

Method of preparation- All the drug are taken and ground well. Now water is added to it and it is churned well. It is filtered and used.

Dose- 2 Pala

Therapeutic uses- Madatayaya

Tandulodaka

Definition- It is the liquid obtained by decanting the mixture of rice and water in a specific ratio.

Method of Preparation-

कण्डितं तण्डुलपलं जलेऽष्टगुणिते क्षिपेत्।
भावयित्वा जलं ग्राह्यं देयं सर्वत्र कर्मसु॥
(Sha.Madh. 1/28

1 Pala of rice is ground well. Now 8 times of water is added to it, Now it is washed and the obtained liquid is known as Tandulodaka. It is used as Anupana of Pushyanuga Churna. According to Ayurvedic Formulary of India after mixing water to rice it should be kept for 2 hours and thereafter decant it.

Principle involved- Kshipta

Instruments used in small and large scale production- Mortar pestle and stainless steel vessel

Siddhi Lakshana- White coloured liquid

Storage- used in fresh condition

Shelf life- should be used fresh

Panaka

Definition- The liquid obtained after decanting the water mixed with Jaggery, Amlika etc. is known as Panaka.

Method of Preparation-

फलमम्लमनम्लं वा शीताम्बुपरिमर्दितम्।
सितामरिचसंयुक्तं पूतं स्यात् पानकं वरम्॥
(Divya Guna Vijgyana Yadav ji 8/37)

Fruits, Amala or may be Anamla, are ground with in cold water and then filtered. Sugar and Marich are added to this. It is known as Panaka.

Principle involved- Mardan and Galana

Instruments used in small and large scale production- Stainless steel vessel

Siddhi Lakshana- Liquid having Rasa, Gandha Varna of main drug

Storage- used in fresh condition

Shelf life- should be used fresh

Chincha Panaka

Anubhuta

Ingredients-

1. Ripen Tamrind fruit (Seed less)-100 gm.
2. Sugar-200 gm.
3. Saindhava Lavana-10 gm
4. Roasted Jeeraka Churna-10 gm
5. Maricha Churna-10 gm
6. Water-400 ml.

Instruments/Equipment's- Stainless steel vessel, Cotton cloth

Method of preparation- Tamarind fruits are dipped into water for some times. Then it is macerated well and filtered. After that sugar, Saindhava Lavana, Jeeraka and Maricha powder are added to it.

Therapeutic uses- Deepana, Pachana, Aruchi etc.

Chandna Panaka

Anubhuta Yoga-

1. Shweta Chandna powder-100 gm
2. Sugar-250 gm
3. Nimba Rasa-10 ml
4. Water-400 ml

Instrument/Equipment's- Stainless steel vessel, Cotton cloth, Heating device.

Method of preparation- Shweta Chandna powder is dipped into water and left for some times.

Now it is macerated well and filtered through cotton cloth. Sugar is added to it and Paka is done. When it is concentrated (i.e. One tara) heating is stopped and Nimba rasa is added and filtered again.

Therapeutic uses- Daha, Mutra Vikara, Trishna etc.

Arka Kalpana

Definition of Arka : Arka is a liquid preparation obtained by distillation of certain liquids or of drugs soaked in water by using the Arka Yantra or any other convenient modern distillation apparatus. (A.F.I. part I)

Advantage of Arka Kalpana

1. Drug having volatile oil as active ingredients are subjected to Arka Kalpana without any damage to its active principle.
2. Arka is a suspension of the distillate in water having slight turbidity and colour according to the nature of the drugs used and smell of the predominant drug.
3. The taste of drug do not comes in the Arka and thus increasing its palatability.
4. Dose is very less.
5. Shelf life is more and it is one year.

Method of preparation- The drugs are cleaned and coarsely powdered. Some quantity of water is added to the drugs for soaking and kept over night. This makes the drugs soft and when boiled releases the essential volatile principles easily. On the next morning it is filled into the Arka yantra and the remaining water is added and boiled. The vapour is condensed and collected in receiver. In the beginning the vapour consists of only steam and may not contain the essential principles of the drug. It should therefore be discarded. The last portion also may not contain therapeutically essential substance and should be avoided. The aliquots collected in between contain the active ingredients and may be mixed together to ensure uniformity to Arka.

Note- For the Arka preparation 10 times of water or as indicated in the formulation should be taken. According to Unani Dravya-Gunaadarsha 1 Shera Arka is obtained from 10-15 Tola of drugs. If Arka is to be obtained 2 Shera Arka from 1 Pava (250 gm) of Aushadha then 4 Shera of water should be taken when the Arka quantity is appoximate 70% of water taken extraction then process should be stopped.

Agni for obtaining Arka

अर्कनिष्कासनार्थाय क्रमाद्देयाः षडग्नयः ।
धूमाग्निश्चैव मन्दाग्नि र्दीपाग्निर्मध्यमस्तथा ॥
खराग्निश्च भटाग्निश्च तेषां वक्ष्यामि लक्षणम् ॥
(A.P. 1/80)

There are six types of Agni that are used to obtain Arka

1. Dhoomagni
2. Mandagni
3. Deepagni
4. Madhymagni
5. Kharagni
6. Bhatagni

Fuel used in the form of wood then it should be dry. Khadira Kashtha is very good for Arka extraction. Initially the temperature should be equal to boiling point after boiling is started then temperature should be between 60 to 650C.

Principle involved- Distillation

Instruments used in small and large scale production-Distillation apparatus

Siddhi Lakshana- Suspension of the distillate in water having slight turbidity and colour according to the nature of drug and smell of the predominant drug,

Storage

जीर्णास्थिपात्रे गृह्णीयादर्कं वा काचसम्भवे ।
पाषाणकेऽथवा पात्रे ह्यभावे मृण्मयेन्यसेत् ॥
(A.P. 1/87)

Arka should be stored in Jirnasthi Patra or glass or stone pot. If these are not available then earthen pot should be used. Now a days glass is used for storing Arka.

Shelf life-One year

Yavani Arka

Reference- Ayurvedic formulary of India Part II

यवान्याः पाचनो रूच्यो दीपनास्त्रिक्शूलहृत् ।
(A.P. 3/7)

Ingredients-

1. Yavani-1 Part
2. Water (for soaking)-2 Parts
3. Water for obtaining Arka-4 Parts

Yantra- Arka Yantra

Method- Yavani is made into coarse powder then it is soaked in water for overnight. On the next day it is filled into Arka Yantra and remaining water is added. Heat is given to Yantra to obtain Arka.

Therapeutic uses- Pachana, Ruchya, Deepana, Trikshoolahara

Dose- 10 ml to 25 ml

Mishreya Arka

Reference- Ayurvedic formulary of India Part I

मिश्रेयाया बह्निमान्द्ययोनिशूल कृमीन् हरेत ॥
(A.P. 3/10)

Ingredients-

1.Mishreya-1 kg
2.Water (For soaking)-7 lt. and preparing Arka
3. Quantity of Arka obtained-5 lt.

Yantra-Arka yantra (Distillation apparatus)

Method of preparation- Mishreya is made in coarse powder form. It is soaked with some quantity of water and left for overnight. On next day it is filled into Arka Yantra and remaining water is added to it. Arka is obtained by distillation process.

Therapeutic uses- Agnimandya, Yoni Shula, Krimi Roga

Dose- 12 to 24 ml.

Gulab Arka

Ingredients-

1. Fresh rose petals-1 Part
2. Water-10 Parts

Yantra- Distillation apparatus

Method of preparation- Rose petals are filled into Arka Yantra and water is filled into it. Now it is heated. Temperature should not be, more than 650C. When 70% of Arka is obtained then the process is stopped and obtained Arka is kept into glass bottle.

7 CHAPT. Kalpana Nirmana II (Method of Preparation of different dosage forms & Dietary Supplements)

Syllabus

Avaleha - Definition, reference, essential ingredients, general method of preparation, specific rules of avaleha preparation, importance of temperature, siddhi lakshana, shelf life with examples i.e. Vasavaleha, Kushmanda avaleha, research updates on Avaleha Kalpana, market survey.

Sneha Kalpana- Aims of Sneha Kalpana, definition, reference, essential ingredients, general method of preparation, specific rules of sneha preparation, importance of temperature, gritha murchana, taila murchana, sneha siddhi lakshana, types of snehapaka, Patra (Gandha Paka), time duration to cook Sneha preparation, shef life with examples Phala grita and Ksheerabala Bala Taila, Concept of Avartana, Research updates on snehakalpana, market survey.

Sandhana Kalpana- Introduction, significance of sandhana kalpana, classification, difference between Madhya and Shukta Kalpana, general method of preparation, essential ingredients, anukta Mana, sandhana vidhi, observations, Burning candle test, Lime water Test, important factors in Asava Arishta Preparation like sandhanan patra selection, place for fermentaion, importance of room temperature, sandhana kala, adding of honey, bhasma, Prakshepaka dravya, difference between Asava & Arishta, shelf life and alcohol % with examples Draksharista and Usheerasava, Research updates on Sandhana Kalpana, market survey.

Pathya Kalpana Definition , significance of Pathya, types, general, method of preparation Manda, Peya, Yavagu, Vilepi, Anna or Odana Kalpana, Krashara, Yusha, Takra, Khada, Kambalika, Raga, Shadava, Related Research updates, Market survey of Dietary Supplements

Learning objectives

1. Explain the basic principles involved, processing techniques, quality control parameters used/ involved in the preparation of Avaleha, Kalpana with examples, instruments used in small and Large scale production, Research updates
2. Explain the basic principles involved, processing techniques, quality control parameters used/ involved in the preparation of Sneha Kalpana, Kalpana with examples, instruments used in small and Large scale production, Concept of Avartana, Research updates on Sneha Kalpana, Market survey.
3. Describe the Significance of Sandhana Kalpana, classification, Difference between Madya and Shukta Kalpana, general method of preparation, essential ingredients, Anukta Mana, Sandhana Vidhi, observations, Burning candle test, Lime water Test, difference between Asava and Arishta, essential knowledge of sale and clinical practice, Research updates
4. Explain Definition, significance of Pathya, types, general, method of preparation Manda, Peya, Yavagu, Vilepi, Anna or Odana Kalpana, Krushara, Yusha, Takra, Khada, Kambalika, Raga, Shadava, Related Research updates, Market survey of Dietary Supplements and Nutraceuticals

Total - 09 hours (Lecture :05 hour, Non-lecture: 04 hours)

Marks- 10 marks, LAQ (10 Marks)- Yes, SAQ (5 Marks)- Yes, MCQ- Yes

Avaleha

Avaleha is such type of dosage form that is administered by method of licking. It is one of the popular dosage forms that can be administered in all the three-age group i.e. Bala, Yuva and Vruddha very easily. In the description of Avaleha the term Avaleha, Leha and Prasha words are used. These words are described as follows:

1. Avaleha word (अव+लिह्+घञ्) is derived after addition of (अव) Upasarga to Liha Dhatu and Ghana (घञ्). Prataya that means to lick and it denotes as process also.
2. Leha word is formed as Liha (efuen) Dhatu with Ghana (घञ्) Prataya which means to lick or Achamana.
3. The word Prasha (प्र+अश+घञ्) is derived when Pra (प्र) Upasarga is with Asha (अश्) Dhatu along with Ghana (घञ्) Prataya that means to eat or nourish (Sanskrit Hindi Shauda Kosha Va. Shi. Apte)

Definition

क्वाथादीनां पुनः पाकाद्घनत्वं सा रसक्रिया।
सोऽवलेहश्च लेहः स्यात्तन्मात्रा स्यात्पलोन्मिता॥
(Sha.Madh. 8/1)

Kwatha, Swarasa etc. are again boiled till these becomes thick. These are known as Avaleha and Leha.

Essential ingredients

The following components are required for the preparation of Avaleha-

1. Liquid Dravya like Kwatha, Swarasa.
2. Sweetening substances like Guda (Jaggery), Sharkara, Matsyandika etc.
3. Prakshepaka Dravya.
4. Madhu (Honey)

Besides these in some of the Avaleha Sneha Dravya like Tail, Ghrita, Kalka Dravya like Amalaki is also used.

General method of preparation for Avaleha

1. If Avaleha is to be prepared from Swarasa then it should be prepared first.
2. If Kwatha is to be prepared then Kwatha is prepared by following method described.
3. Kalka should be fried well before adding it into sugar solution.
4. Sugar solution is made by adding sweetening substance into Kwatha or Swarasa or liquid specified.
5. It is heated till the appearance of Siddhi Lakshana.
6. Prakshepaka Dravya should be added in the form of very fine powder after cooling to some extent.
7. Honey should be added after complete cooling.

Specific rules of Avaleha preparation

सिता चतुर्गुणा कार्या चूर्णाच्च द्विगुणो गुडः।
द्रवं चतुर्गुणं दद्यादिति सर्वत्र निश्चयः॥
(Sha. Madh. 8/2)

If quantity of Sita is not mentioned in a Avaleha formulation then it should be taken four times from the quantity of Churna. Likewise, it is prepared from Guda and quantity is not mentioned then it should be taken as two times and if Drava is Anukta, then it is taken as four times.

Avaleha Siddhi Lakshana

तं लेहं साध्येद्द्रव्यां घट्टयन्मृदुनाऽग्नि।
यावत् स्यात्तन्तुमत्तोये पतितं तु न शीर्यते॥
(Cha. Kalp. 3/17)

लेहस्य तन्तुमत्ताऽप्सु मज्जनं सरणं न च।
(As. Hrid. Kalp. 6/19)

सुपक्वे तन्तुमत्त्वं स्यादवलेहोऽप्सु मज्जति।
स्थिरत्वं पीडिते मुद्रागन्धवर्णरसोद्भवः॥
(Sha. Madh. 8/3)

These Lakshana are described as follows-

Sr. No.	Sign	Illustration
1.	Darvi Pralepa	Stickiness of sugar solution to the ladle
2.	Tantu Mattavama	When drop if in process sugar solution is put over thumb keep the index finger over it then stretching of index finger produces thread in between thumb and index finger.
3.	Appasu majjanam	When drop of sugar solution is poured into vessel with Sarnam filled with water. It sinks and spreads in water.
4.	Appasu majjanam	The drops of sugar solution sinks to bottom but does with Sthiratva not spread and easily picked with finger.
5.	Patitastu Na Shiryate	When drop is poured over plate it does not spread or break.
6.	Pidete Mudra	Form impression of thumb when pressed
7.	Gandha,Varna, Rasatpatti	Having taste, colour, smell of that of ingredients.

Shelf life- 3 years

Vasavaleha

वासकस्य रस प्रस्थं मानिका सितशर्करा।
पिप्पल्या द्विपलं तावत्सर्पिषश्च शनैः पचेत्॥
तस्मिल्लेहत्वमायाते शीते क्षौद्रपलाष्टकम्।
दत्त्वाऽवतारयेद् वैद्यो लीढो लेहोऽयमुत्तमः॥
हन्त्यमेव राजयक्ष्माणं कासं श्वासं च दारुणम्।
पार्श्वशूलञ्च हृच्शूलं रक्तपित्तं ज्वरं तथा॥
(Bha.Pra.Rayakshma. 55-57)

Ingredients-

1. Vasa Swarasa/Kwatha- 1 Prastha (64 Tola)
2. Sharkara- 1 Manika (8 Pala/32 Tola)
3. Pippali Churna-2 Pala (8 Tola)
4. Ghrita-2 Pala (8 Tola)
5. Madhu (Honey)- 8 Pala (32 Tola)

Ingredients/Equipment's- Stainless steel vessel, Mortar pestle, Cotton cloth, heating device.

Method of preparation- Vasa Swarasa is obtained by fresh Vasa leaves or Vasa Kwatha is prepared with Vasa Kwatha Churna and water. To this Swarasa or Kwatha, Sharkara is added and it boiled till appearance of Avaleha Siddhi Lakshana. Pippali is mixed after some cooling. When it is complete cooled then Madhu (honey) is added to it.

Dose- 4 Masha to 8 Masha (One Tola)

Therapeutic uses- Rajayakshma, Kasa, Shwasa, Parshva Shoola, Hridshoola, Rakta Pitta and Jwara.

Kushmandaavaleha

निष्कुलीकृत्य कूष्माण्ड खण्डात्पलशतं पचेत्।
निक्षिप्य द्विगुणं नीरमर्धशिष्टं च गृह्यते॥
तानि कूष्माण्डखण्डानि पीडयेदृढवाससा।
आतपे शोषयेत्किंचिच्छूलाग्रैर्बहुशो व्यधेत॥
क्षिप्त्वा ताम्र कटाहे च दद्यादष्टपलं घृतम्।
तेन किंचिद्भर्जयित्वा पूर्वोक्तं तज्जलं क्षिपेत्॥
खण्डात्पलशतं दत्त्वा सर्वमेकत्र पाचयेत्।
सुपक्वे पिप्पली शुण्ठी जीरकं द्विपलं पृथक्॥
पृथक्पलार्धं धान्याकं पत्रैला मरिचं त्वचम्।
चूर्णीकृत्य क्षिपेत्तत्र घृतार्धं क्षौद्रमावपेत्॥
खादेदाग्निबलं दृष्ट्वा रक्तपित्ती क्षयी ज्वरी।
शोष तृष्णावमिच्छर्दिश्वासकासक्षतातुरः॥
कूष्माण्डकावलेहोऽयं बाल वृद्धेषु युज्यते।
उरः सन्धानकृद्बृष्यो बृंहणो बलकृन्मतः॥
(Sha. Madh. 8/22-28)

Ingredients-

1. Kushmanda [Seed Less]- 100 Pala
2. Water-200 Pala
3. Ghrita- 8 Pala

4. Khanda- 100 Pala
5. Prakshepaka Dravya-
   - Pippali - 2 Pala
   - Shunthi- 2 Pala
   - Shweta Jeeraka- 2 Pala
   - Dhanyaka- 1/2 Pala
   - Tejpatra- 1/2 Pala
   - Ela 1/2 Pala
   - Maricha 1/2 Pala
   - Twak 1/2 Pala
6. Madhu (honey)- 4 Pala

Method of Preparation- Small pieces of seedless Kushmanda pierced with fork and these are obtained in two times of water when water remains half of its quantity then it is taken out from fire and filtered. Now Kushmanda pieces are kept in cloth and it in pressed so that water is squeezed. There are kept in sunlight for complete drying. Ghrita is taken in a Tamra Patra and Kushmanda pieces are fried well. In another vessel the reduced water [100 Pala] is taken and sugar solution is made by adding mixing khanda into it. When sugar solution having consistency of 1-2 Tarra is prepared then Kushmanda pieces are added into it and Paka is done till appearance of Siddhi Lakshana. After that heating is stopped and Prakshepaka Dravyas are mixed. Honey is added after cooling.

Research updates

*Studies done on Chyavanprasha show that it contains Vitamin C, polyphenoic compounds including flavonoids. Phenolic compounds present in the Chyavan Prasha possess antioxidant property which attributes it for Rasayana Guna. HPTLC studies shows that various biologically active compounds are present in Chyavanprasha. Some of these are Gallic acid, Proto catechuic acid, Catechin, Caffeic acid, vanillic acid, chlorogenic acid, rutin, Ferulic acid. These are responsible for therapeutic activity." As per the Ayurvedic Pharmacopoeia of India, Gallic acid in the chyavanprash should not be less than 0.5%

Chyavanprasha also contains protein, fiber, carbohydrate and minerals like Fe, Zn, and Cu.

Sharma R, Martins N, Kuca K, Chaudhary A, Kabra A, Rao mm, Prajapati PK; Chayawanprash: A Traditional Indian Bioactive Health supplement. Biomolecules: 2019 Apr 26; 9(5): 161 doi 10.33901 biom 9050161. PMID 310 35513: PMCID: Pmc 6571565

Study done by Gupta A and Prajapati PK on the effect of different formulations of Avaleha on Shawas Roga shows that Kamsa Haritaki, Kantkari Avaleha, Bharangi Avaleha and Vasa Avaleha are very effective in Bronchial Asthama. These can be used according to Roga and Rogi. The study was done at IPGT and RA.

Gupta A. Prajapati PK, Clinical Efficacy of Different Avalehas in Bronchical Asthama . AYV. 2011 Jul; 32(3) 427-31, doi-10,4103/0974 -8520-93928 PMID 225 29664, PMCID PMC 3326896

A Study was done by Gupta Ankit et.al on the analytical study of Vasa Avaleha prepared by Vasa Swarsa and Vasa Kwatha. It was found that Vasa Avaleha contains vasicine and vascinone when compared with standard in TLC study. These are having broncodilatory activity.

Ankit Gupta, AK Choudhary, PK Prajapati- A comparative study of Vase Avaleha prepared by was Swarasa and Kwatha. JRAS Vol XXX 1-4 , Jan - Dec 2014 pp 1-16.

Market Survey- Market is the survey research and unit of analysis of the market for a particular product/ service which includes the investigation into customer inclination. Market survey of Avaleha can be done on following points-

1. Name of the product
2. Name of Reference of the pharma company & Manufacturing/marketing it.
3. Total number of pharma companies.
4. Other dosage form of the same product available - like. Candy, granules etc.
5. Packaging size
6. Distribution/ Delivery channel
7. Cost of the product of different pharma companies
8. Availability in the market.

9. Rejuvenator
10. Category of the drug - Nutraceutical, Rejuvenator etc.

Sneha Kalpana

The nomenclature of Sneha Kalpana is sum of words Sneha and Kalpana. Where Sneha means fat or fatty material and Kalpana stands for pharmaceutical process of medicaments.

Aims of Sneha Kalpana-Sneha Kalpana has widely used in Ayurveda for the treatment of diseases. It has been used from different route like Oral, Nasal, Rectal, Vaginal and Urethral. In this Kalpana four different types of Sneha like Ghrita, Taila, Vasa and Majja are used after processing it with drug. It can be used alone or along with two (Yamak), three (Trivrat) or all of four i.e. Maha Sneha. It has following aims-

1. Sneha pacifies Vata and Vata is dominant amongst three Doshas.
2. Sneha is used as chief ingredient in Basti Kalpana which is used for the treatment of various diseases.
3. Sneha crosses the blood brain barrier

Definition- Sneha (Ghrita/Taila) is the preparation in which Sneha is boiled with prescribed Kashaya and Kalka of drugs according to formulation. This process ensures absorption of the active therapeutic properties of the ingredients used.

Essential ingredients

There are generally three essential components for the preparation of Sneha (Ghrita or Taila) viz. as mentioned below :

1. Drava Dravya (A liquid which may be one or more as Kashaya, Swarasa, Dugdha, etc.
2. Kalka (A fine paste of the drug or drugs).
3. Sneha Dravya (Ghrita, Taila, etc.).

Generally, unless otherwise mentioned in the text, if Kalka is one part by weight, Sneha should be four parts and the Drava Dravya should be sixteen parts.

All of the three ingredients are taken in specific ratio and Snehapaka is performed.

General method of preparation

कल्काच्चतुर्गुणीकृत्य घृतं वा तैल मेव वा।
चतुर्गुणे द्रवे साध्यं तस्य मात्रा पलोन्मिता॥
(Sha. Madh. 9/1)

Ingredients-

1. Aushadhi Kalka - 1 Part
2. Sneha Dravya - 4 Parts
3. Drava Dravya - 16 Parts

All these ingredients are taken together and Paka is done.

Specific rules of Sneha preparation

Rules for taking of water to prepare Kwatha- If in the formulation amount of water for the preparation of Kwatha is not given then it is taken as follows-

निक्षिप्य क्वाथयेत्तोयं क्वाथ्यद्रव्याच्चतुर्गुमम्।
पादशिष्टं गृहीत्वा च स्नेहं तेनैव साधयेत्॥
(Sha. Madh. 9/12)

Water is taken four times to that of Kwatha drugs and it is reduced till one fourth of water is left. It is then filtered and this Kwatha, is used for the preparation of Sneha.

If in the formulation only drugs are mentioned and water is not given then in this condition according to nature of drug quantity of water is decided.

चतुर्गुणं मृदुद्रव्ये कठिनेऽष्टगुणं जलम्।
तथा च मध्यमे द्रव्ये दद्यादष्टगुणं पयः॥
अत्यन्त कठिने द्रव्ये नीरं षोडशिकं मतम्॥
(Sha. Madh. 9/3)

If drug is Mridu like Guduchi then 4 times of water is taken. If drug is Kathina like Dashamula or Madhyama like Aragvadha etc. then eight times of water is taken. If it is Atayanta Kathina like Padmaka then 16 times of water is taken. It is reduced till one fourth quantity of water is left.

Note- If Mridu and Kathintara drugs are mixed

together then in these conditions 8 times of water is taken and one fourth quantity is obtained.

If quantity of drug is given but amount of water is not given then water is taken for preparing the Kwatha as per following rules.

कर्षादितः पलं यावत्क्षिपेत्षोडशिकं जलम्।
तदूर्ध्वं कुडवं यावद्धवेदष्टगुणं पयः॥
प्रस्थादितः क्षिपेन्नीरं खारी यावच्चतुर्गुणम्॥
(Sha. Madh. 9/4-5)

It can be show as follows:

Sr. No.	Quantity of drug	Amount of water	Reduced up to
1.	1 Karsha up to 1 Pala	16 times	1/4
2.	1 Pala up to 1 Kudava	8 times	1/4
3.	1 Prastha to 1 Khari	4 times	1/4

Note- Here three conditions are explained-

1. As per nature of drug the quantity of water is given i.e. 4, 8 or 16 times.
2. According to Mana of drug quantity of water i.e. 4, 8, or 16 times.
3. In general the quantity of water i.e. 4 times.

Anukta Paribhasha for Sneha Paka

स्नेह भेषज तोयानां प्रमाणं यत्र नेरितम्।
तत्रायं विधिरास्थयो निर्दिष्टे तद्वदेव तु॥
(Su. Chi. 31/9)

If quantity of Sneha, Bheshaja and water is not mentioned then Kalka drug 1 Part, Sneha 4 Parts and water 16 parts are taken.

अनुक्ते द्रवकार्ये तु सर्वत्र सलिलं मतम्।
कल्क क्वाथावनिर्देशे गणात्तस्मात् प्रयोजयेत्॥
(Su. Chi. 31/10)

If any liquid is not mentioned then water should be taken. If Kalka or Kwatha drugs are not given then according to context drugs of that particular Gana should be taken.

Rules for taking quantity of Drava being one or more than one

In the classics there is description of formulation in which more than one liquid is used for Sneha Paka. If the quantity of these liquids is not mentioned then the following rules in followed.

द्रवाणि यत्र स्नेहेषु पञ्चादीनि भवन्ति हि।
तत्र स्नेहसमान्याहुर्यथापूर्वं चतुर्गुणम्॥
(Sha. Madh. 9/8)

In the formulation where five liquids are said for Sneha Sadhana then each of five liquids are to be taken similar to quantity of Sneha.

Notes- If Sneha Siddhi is to be done by taking more than one liquid then the following rule is accepted as per Jejjata.

एक द्वित्रिद्रवैर्द्रव्यैः कुर्यात् स्नेहाच्चतुर्गुणं। क्षीरं स्नेहसमं दद्यात् चतुर्भिश्च चतुर्गुणम् इति॥ अस्यायमर्थः यत्रैको द्रवैस्तत्रैकेन चातुर्गुण्यं, एवं द्वाभ्यां, त्रिभिर्मिलित्वा चातुर्गुण्यमित्यर्थः। यत्र पञ्चाधिकानि भवन्ति तत्र स्नेसमानीति पूर्वार्धः। (Jejjata)

If Sneha is Sadhita by taking one liquid, then it is taken 4 times to that of Sneha. If two liquids are taken then both are taken 2 times each. If three liquids are taken then it should be 4 times cumulatively. In case where four liquids or five liquids is to be taken then all of the liquids should be taken in similar quantity of Sneha.

Quantity of Kalka in Snehapaka according to different Drava

Depending upon type of Drava Dravya the amount of Kalka is different. It is taken as per following direction.

अम्बुक्वाथ रसैर्यत्र पृथक्स्नेहस्य साधनम्।
कल्कस्मयांशं तत्र दद्याच्चतुर्थषण्ङ्गमष्टमम्॥
दुग्धे दध्निरसे तक्रे कल्को देयोऽष्टमांशकः।
कल्कस्य सम्यकपाकार्थं तोयमत्र चतुर्गुणम्॥
(Sha. Madh. 9/6-7)

It can be summarised as follows:

Sr. No.	Drava Dravya	Quantity of Kalka
1.	Water	1/4 of Sneha
2.	Kwatha	1/6 of Sneha
3.	Swarasa	1/8 of Sneha
4.	Ksheera, Dadhi, Mamsa Rasa, Takra	1/8 of Sneha

However, 4 times of water is added in each of the condition for the proper Paka of Kala as it is necessary for Viryadhana (Proper extraction of active principal from drug to Sneha)

स्वक्षीरमाङ्गल्यैः पाको यत्रेरितः क्वचित्।
जलं चतुर्गुणं तत्र वीर्याधानार्थमावपेत्॥
न मुञ्चति रसं द्रव्यं क्षीरादिभिरूपस्कृतम्।
सम्यक पाको न जायेत तस्मात्तोयं चतुर्गुणम्॥

(Vaidyaha pari. Pradeep)

When Sneha paka is done by taking Ksheera, Dadhi etc. the for Viryadhana four times of water should be added because in such condition drug should not release its Rasa i.e. active principle so it is necessary to add four times of water for proper extraction from drug.

Method of Sneha Paka only with Kwatha

क्वाथेन केवलेनैव पाको यत्रेरितः क्वचित्।
क्वाथद्रव्यस्य कल्कोऽपि तत्र स्नेहे प्रयुज्यते॥

(Sha.Madh. 9/9)

If for Sneha Paka only Kwatha is mentioned then there Kwatha drugs should be used as Kalka before going to Paka.

Note- In this condition Kwatha is prepared by taking said Kwatha Dravya. These Kwatha Dravya in the quantity of one fourth to the Sneha should be used as Kalka drugs.

द्रव्येण केवलनैव स्नेहपाको भवेद्यदि।
तत्राम्बुपिष्टः कल्कः स्याज्जलं चात्र चतुर्गुणम्॥

(Sha. Madh. 9/8)

If in a formulation only Kalka drugs are mentioned then these drugs are ground with water and four times of water is used as liquid Dravya.

कल्कहीनस्तु यः स्नेहः स साध्यः केवले द्रवे।

(Sha.Madh. 9/10)

If Kalka is not mentioned then Sneha Sadhana can be done by taking only Drava also.

Ghrita Murcachana

पथ्याधात्रीविभीतैर्जलधररजनीमातुलुङ्गद्रवैश्चसर्वैरेतैः सुपिष्टैः पलकपरिमितैर्मन्दमन्दानलेन।
आज्य प्रस्थं विपेनं परिचपलगतं मूर्च्छयेद्वैद्यराजस्तस्मा-दामोपदोषंहरति च सहसा वार्यवान् सौख्यदापि॥

(B.R. Jwara. 1285)

Murcchana drugs-

1. Haritaki
2. Amalaki
3. Bibhitaki
4. Musta
5. Haridra
6. Matulunga Nimbu

All of the drugs are taken in one Pala quantity, Ghrita one Prastha and water is taken in one Prastha quantity.

Method- Ghrita is heated over Mandagni then all the drugs in Kalka form are added along with water. Now it is heated over mild fire. When water is completely evaporated then it is taken out from fire and filtered. By this process Aam Dosha of Ghrita is removed and Ghrita becomes Viryavana and Saukha karaka.

Result of Murcchana- From the Murcchana process the following are achieved.

1. Amadosha is removed.
2. Gandha Dosha of Sneha is removed and it becomes good coloured as well as flavoured.
3. Ghrita becomes Viryavana and Sukhadayaka.

Tila Taila Murcchana

तैलं कृत्वा कटाहे दृढतरविमले मन्दमन्दानलैस्तत् तैलं निष्फेनभावं गतमिह च यदा शैत्यभावं समेत्य।
मञ्जिष्ठारात्रिलोध्रैर्जलधरनलिकैः सामलैः साक्षपथ्यैः सूचीपुष्पाङ्घ्रनीरैरुपहितकथितैर्गन्धयोगं जहाति॥
तैलस्येन्दुकलांशिकैकविकसा भागोऽपि मूर्च्छाविधौ ये चान्ये त्रिफलापयोदरजनीह्वीबेरलोध्रान्विताः।
सूचीपुष्पवटावरोहनलिकास्तस्याश्च पादांशिकादुर्गन्धं विनिहन्ति तैलमरुणं सौरभ्यमाकुर्वते॥

(B.R. Jwara. 1286-87)

Murcchana drugs-

1. Manjishtha
2. Haridra
3. Lodhra
4. Musta
5. Nalika
6. Amalaki

7. Bibhitaki
8. Haritaki
9. Ketaki
10. Vata Shunga
11. Hibera
12. Water

Manjishtha is taken 1/10 Part and other drugs are taken, 1/4 part from the quantity of Tila Taila.

Process- Taila is taken into an iron vessel and it is heated over mild fire. When Phena is disappeared then Kalka Dravya is added. After that water is added and it is heated till appearance of Siddha Lakshana. Now it is taken out from fire and filtered through cotton cloth. It is Murcchita Tila Taila having good flavour and red colour.

Katu Taila Murcchana

वयस्थारजनीमुस्तबिल्वदाडिमकेशरैः ।
कृष्णजीरकह्रीबेरनलिकैः सविभीतकैः ॥
एतैः समांशैः प्रस्थे च कर्षमात्रं प्रयोजयेत् ।
अरुणाद् द्विपलं तत्र तोयञ्चाढकसम्मितम् ॥
कटुतैलं पचेत्तेन चामदोषहरं परम् ॥
(B.R. Jwara. 1288-89)

Murcchana drugs-

1. Haritaki
2. Haridra
3. Musta
4. Bilva Phala
5. Dadima Beeja
6. Nagakeshara
7. Krishna jeeraka
8. Hibera
9. Nalika
10. Bibhitaka
11. Manjishtha

Here Manjishtha is taken 2 Pala and the rest of drugs in 1 Karsha quantity. Taila is taken 1 Prashta while water 1 Adhaka.

Method- Taila is heated over Mandagni till disappearance of it is heated till Siddhi Lakshana appeared. After that it is filtered.

Eranda Taila Murcchana

विकसा मुस्तकं धान्यं त्रिफला वैजयन्तिका ।
ह्रीवेरवनखर्जूरवटशुङ्गा निशायुगम् ॥
नलिका भेषजं देयं केतकी च समं समम् ।
प्रस्थे देयं शाणमितं मूर्च्छने दधिकाञ्झिकम् ॥
(B.R. 1290-91)

Murcchana drugs-

1. Manjishtha
2. Musta
3. Dhanyaka
4. Aamalaki
5. Haritaki
6. Vibhitaki
7. Aravi
8. Hwibera
9. Vana kharjura
10. Vata shunga
11. Haridra
12. Daruharidra
13. Nalika
14. Shunthi
15. Ketaki
16. Dadhi
17. Kanji

Drugs from 1 to 15 are taken in 1 Shana quantity each. Dadhi 128 Tolas, Kanji 120 Tolas, Eranda Taila 64 Tolas and water in the quantity of 256 Tolas are taken.

Method- Eranda Taila is heated over mild fire by taking it into an iron vessel. When Phena is disappeared then Kalka of all herbal drugs are added to it. After that Dadhi and Kanji are added and heated till the appearance of Siddhi Lakshana. After that it is filtered. It is Murcchita Eranda Taila.

Note- The word Murcchana is formed as-

मुच्छं + णिच् धातु + ल्युट् प्रत्यय - (Sanskrita Hindi Shabda Kosha V.S. Aapte)

having its meaning to increase, to improve or providing Bala.

So, Sneha Murcchana can be defined as ''A pharmaceutical process or Samskaras that provides Bala or increase its potency is termed as Sneha Murcchana. It is described by Aacharya Govind Nath Sen in Bhaishyja Ratnavali as follows-

औदौ संमूर्च्छयेत् स्नेहं क्वाथं संचारयेत्ततः ।
दुग्धं कल्कं क्रमाद्दद्याद् गन्धद्रव्यं ततः परम् ॥
एवं रीत्या मन्दमन्दालेनैव पचेद्भिषक् ।
निर्मलं निर्जलं दृष्ट्वा स्नेहसिद्धिं तु लक्षयेत् ॥
(B.R. Jwara 1283-84)

While going for Sneha Siddhi the following steps should be followed

Sneha Murchchhana
↓
After that Kwatha is added
↓
Addition of milk
↓
Addition of Gandha Dravya

Paka is done over Mandagni till appearance of Sneha Siddhi Lakshana

Result of Murcchana- From the Murcchana process the following are achieved.

1. Amadosha is removed.
2. Gandha Dosha of Sneha is removed and it becomes good coloured as well as flavoured.
3. Ghrita becomes Viryavana and Sukhadayaka.

Sneha Siddhi Lakshana

Sneha Siddhi Lakshana are indicative of completion of process of Paka. According to Aacharya Sushruta these are as follows:

शब्दस्योपरमे प्राप्त फेनस्योपशमे तथा।
गन्धवर्णरसादीनां सम्पत्तौ सिद्धिमादिशेत्॥
घृतस्यैव विपक्वस्य जानीयात् कुशलो भिषक्।
फेनोऽतिमात्रं तैलस्य शेषं घृतवदादिशेत्॥
(Su. Chi. 31/12-13)

Sneha Siddhi Lakshana include

1. When drops of Sneha poured over fire there is no cracking sound.
2. Phena Shanti occurs in case of Ghrita Paka. While Phena Udagama occurs in Taila Paka.
3. Gandha, Varna and Rasotpatti occurs according to drug used.

Note- According to Aacharya Dalhana during Sneha Paka sound comes from two source that is from liquid and from Kalka.

शब्दस्य उपरम indicative of no crackling sound comes from liquid.

According to Acharya Sharangadhara

वर्तिवत्स्नेहकल्कः स्याद्यदाङ्गुल्या विमर्दितः।
शब्द हीनोऽग्निक्षिप्तः स्नेह सिद्धो भवेत्तदा॥
यदा फेनोद्गमस्तैले फेन शान्तिश्च सर्पिषि।
गन्धवर्णोरसोत्पत्तिः स्नेह सिद्धिस्तदा भवेत्॥
(Sha. Madh. 9/12-13)

1. **वर्तिवत्स्नेहकल्क** -When Kalka is rolled between finger its Varti can be made.
2. **अङ्गुल्या विमर्दितः शब्द हीनोऽग्निक्षिप्त** - If a part of Sneha Kalka is put into fire no crackling sounds is producing.
3. **फेनोद्गमस्तैले फेन शान्तिश्च सर्पिषि** - Phena Udgama in oil and Phenta Shanti in Ghrita occurs
4. **गन्धवर्णोरसोत्पत्ति**- Gandha, Varna, Rasotpatti occurs in Sneha.

Types of Snehapaka

According to Acharya Sushruta Sneha Paka is of three types-

1. Mridu Paka, 2. Madhya Paka, 3. Khara Paka

तत्र स्नेहौषधि विवेकमात्रं यत्र भेषजं स मृदुरिति, मधूच्छिष्टमिव विशदमविलेपि **यत्र भेषजं स मध्यमः,** कृष्णमवसन्नमीषद्विशदं **चिक्कणं च यत्र भेषजं स खर इति;** (Su. Chi.)

The type of Snehapaka is determined by the character of Kalka by touching as well as its consistency. When there is only slight difference in between the Kalka which is taken initially and consistency of Kalka which is being processed with Sneha then it is Mridu Paka. When Kalka has consistency similar to wax and it is Vishada and Avilepe then it is the condition of Madhyama Paka. When Kalka is Krishna, Avasanna. Vishada and Chikkana then it is Khara Paka stage.

According to Acharya Sharangadhara

स्नेह पाकस्त्रिधा प्रोक्तो मृदुर्मध्यः खरस्तथा।
ईषत्सरसकल्कस्तु स्नेहपाको मृदुर्भवेत्॥
मध्यपाकस्य सिद्धिश्च कल्के नीरसकोमलः।
ईषत्कठिनकल्कश्च स्नेहपाको भवेत्खरः॥
तदूर्ध्वं दग्धपाकः स्याद्याहकृन्निष्प्रयोजनः॥
(Sha.Madh. 9/14-16)

Sneha Paka is of three types that is Mridu, Madhya and Khara. Their characters are as follows:

1. Mridu Paka - Kalka is Ishta Sarasa (Having some watery part)
2. Madhya Paka - Kalka is Neerasa and Komal (Free from watery part and it is soft in touch)
3. Khara Paka - Kalka is Ishta kathina (Kalka becomes hard)

Beyond this Paka there is stage of Khara paka is which Kalka is bunt and it do not have any use.

Sneha paka lakshana according to different Aacharyas

Sr.N.	Paka type	Aacharya Charaka	Aacharya Sushruta	Aacharya Vagbhatta
1.	Mridupaka	Tulye Kalken Niryasa (Kalka)	Vivek Matra Bheshaja	Kitta like Manda Kalka
2.	Madhyapaka	Sanyava like Niryasa (Kalka)	Wax like Kalka Vishada, Avelipi	Kitta like Chikkana and waxy
3.	Khara Paka	Shiryamana Niryasa (Kalka)	Chikkana and Krishna, Varti formed Dagdha Paka in also considered	Krishna, Varti formed Dagdha Paka is considered

Uses of different Sneha Paka

खरोऽभ्यङ्गे स्मृतः पाको मृदुनस्तः क्रियासु च।
मध्यपाकं तु पानार्थे बस्तौ च विनियोजयेत्॥
(Cha. Kalp. 12/104)

These types of Sneha Paka are used as follows :

1. Khara Paka - Used in Abhyanga
2. Madhya Paka - Pana and Basti

आमपाकश्च निर्वीर्यो बह्निमान्द्यकरो गुरुः।
(Sha. Madh. 9/17)

Amapaka is Nirvirya, Guru and cause Agnimandya.

Patra (Gandha Paka)

गन्धनिर्यास पुष्पाणां सिद्धशीतेऽवतारिते।
प्रक्षेपो गन्धवृद्धर्थं पत्रकल्कं तु तद्विदुः॥
(Adhmalla on Sha. Madh. 9/11)

Gandha Niryasa (Flavoured resins), Pushpa are added to Sneha when it is cooled to increase its smell. It is known as Patra Kalka.

त्वाचकुन्दुरूकर्पूरतुरूष्क श्रीनिवासकैः।
लवङ्गनखकंकोलकुष्ठमांसी प्रियङ्गुभिः॥
स्थौणेयतगरध्यामवचा मदनपल्लवैः।
सनागकेशरैः सिद्धे क्षिपेच्चात्रावतारिते॥
पत्रकल्कं ततः पूतं विधिना तत् प्रयोजयेत्।
(Cha.Chi. 28/153-155)

Kunduru, Karpura, Shilarasa, Gandha Biroja, Lavanga, Nakhi, Sheetalchini, Kushtha, Jatamansi. Priyangu Pushpa, Staudeya. Tagar, Vacha are to be added after cooling of Sneha and in the form of powder to increase its flavour.

पत्रकल्कमिति सुगन्धित्वादस्य तैलस्य गन्धशास्त्रपरिभाषाया पत्र कल्को देय इत्युच्यते; गन्धशास्त्रे च चूर्ण स्वरसपुष्पाणां सिद्धशीते ऽवतारिते। दीयते गन्धवृद्धर्य पत्र कल्को मनीषिभिः॥
(Chakrapani on Cha. Chi. 28/153-155)

According to Gandha Shastra Patra Kalka is used to increase the Gandha (Smell) of Sneha and it should be added after cooling of Sneha and in the form of Churna or Swarasa of flowers.

Definition according to Chakradatta

पक्वपूतेऽप्पुष्पा एवं सम्यक् पेषणवर्तितम्।
दीयते गन्धवृद्धयर्थ पत्रकल्कं तदुच्यते॥
(Chakra. Vata. Vya. 309)

Patra Kalka is defined as the Gandha Dravya which are added to Sneha after Taila Paka in the form of powder to increase its smell.

Time duration to cook Sneha preparation

Two types of concepts is found in the classic regarding Paka Kala (Heating duration) of Sneha. These are as follows -

1. घृततैलगुडादीश्च साधयेन्नैकवासरे।
प्रकुर्वन्त्युषिता ह्येते विशेषाद्गुण संचयम्॥
(Sha.Madh. 9/18)

Ghrita, Taila, Guda etc. should not Sadhita (Prepared) within one days. These should be kept for at least one overnight. By doing so these are accumulated with specific properties. It is the general concept regarding Sneha Sadhan.

Note- The total amount of liquid or water should not be evaporated with in same days but some amount should be remained for evocation in next day.

2. According to different Drava Dravya and other Dravyas given in the formulation Sneha Paka is completed in different days which is as follows.

क्षीरे द्विरात्रं स्वरसेत्रिरात्रं तक्रारनालदिषु पञ्चरात्रम् ।
स्नेहं पचेद् वैद्यवरः प्रयत्नादित्याहुरेके भिषजाः प्रवीणाः ॥
द्वादशाहन्तु मूलानां वल्लीनां क्रममेव च ।
एकाहं व्रीहिमांसानां पाकं कुर्याद्विचक्षणः ॥
(Vaidyaka Pari. Pradeep 3/26-27)

Sr. No.	Drav/Dravya	Days of Paka
1.	Ksheera	2 Nights
2.	Swarasa	3 Nights
3.	Takra, Aarnala, Gomutra	5 Nights
4.	Mula and Lata	12 days
5.	Brihi Dhanya and Mamsa Rasa	1 day

Shelf life-

Ghrita- 2 years

Taila- 3 years

Phala Ghrita

त्रिफला मधुकं कुष्ठं द्वे निशे कटुरोहिणी ॥
वटङ्गं पिप्पली मुस्तं विशाला कट्फलं वया ।
द्वे मेदे द्वे च काकोल्यौ सारिवे द्वे प्रियङ्गुका ॥
शतपुष्पा हिङ्गु रास्ना चन्दनं रक्तचन्दनम् ।
जातीपुष्पं तुगाक्षीरी कमलं शर्करा तथा ॥
अजमोदा च दन्ती च कल्कैरेतैश्च कार्षिकैः ।
जीवद्वत्सैकवर्णाया घृत प्रस्थं च गोः क्षिपेत् ॥
चतुर्गुणेन पयसा पचेदारण्यगोमयैः ।
सुतिथौ पुष्यनक्षत्रे भृद्धाण्डे ताम्रजे तथा ॥
ततः बिवेच्छुभदिने नारी व पुरुषोऽथवा ।
एतत्सर्पिर्नरः पीत्वा स्त्रीषु नित्यं वृषायते ॥
पुत्रानुत्पादयेद्धीमान्वन्ध्यादि लभते सुतम् ।
अनायुषं या जनयेद्या च सूता पुनः स्थिता ॥
पुत्रं प्राप्नोति सा नारी बुद्धिमन्तं शतायुष्म् ।
एतत्फल घृतं नाम भारजेन भाषितम् ॥

Ingredients

Kalka Dravya-

1. Triphala
2. Madhuka
3. Kushtha
4. Haridra
5. Daruharidra
6. Katurohini
7. Vidanga
8. Musta
9. Pippali
10. Vishala
11. Kataphala
12. Vacha
13. Medha
14. Mahameda
15. Kakoli
16. Ksheera Kakoli
17. Sheta Sariva
18. Krishna Sariva
19. Priyangu
20. Shatavari
21. Hingu
22. Rasna
23. Chandana
24. Rakta Chandana
25. Jati Pushpa
26. Vamshalochana
27. Kamala
28. Sharkara
29. Ajmoda
30. Danti

All above drug should be taken in one Karsha

Ghrita-1 Prastha (Cow must have live baby of Ekavarna)

Milk- 4 Prastha

Method of preparation- It should be prepared according to Sneha Paka method. It should be manufactured in Pushya Nakshatra.

Benefits - Yoni Shukra Dosha, Vrushya, Medhya, Pumsavana, Ayushya, Paushtika.

Ksheera Bala Taila

बला कल्क कषायाभ्यां तैल क्षीरसमां पचेत् ।
सहस्त्रशतपाकं तद् वातासृग्वातरोगनुत् ॥
रसायनं मुख्यतममिन्द्रियाणां प्रसादनम् ।
जीवनं बृंहणं स्वर्यं शुक्रासृग्दोषनाशनम् ॥
(A.H.chi- 22/45-46)

Ingredients-

1. Bala Kwatha - 16 Parts
2. Bala Kalka- 1 Part
3. Tila Taila- 4 Parts
4. Usheera- 4 Parts
5. Water- 16 Parts

Method of Preparation - Tila Taila is taken

in a stainless-steel vessel and it is heated. Now Kalka is added into it after that Kwatha and Ksheera is added. At last water is added and Paka is done till the appearance of such Siddhi Lakshana. Obtained Sneha is again subjected to Paka. Process is repeated for hundred or thousand times.

Dose - 12 gms. (AFI Part I p329)

Anupana - Milk or Luke warm water

Benefits- Vata Roga

Concept of Avartana

The meaning of word Avartana is repetition of any work or process. Here in the context of Sneha Pake the Paka is times repeated for specific times. Like Shata Paka i.e. repeated for hundred times. In the Avartana of Sneha every time Kalka and Kwatha are taken fresh while so the quantity of Sneha is that which is obtained at the end of Sneha Paka every time.

Importance of Avartana-

इत्येते रसायनाः स्नेह बस्तयः सति विभव शतपाकाः सहस्त्रवाक वा कार्या वीर्यबलाधानार्थमिति ॥

(Cha Siddhi 12/19)

1. It increases the therapeutic efficacy of Sneha.
2. Due to repeated Paka Sneha becomes more absorbable its availability also enhanced.

The reference of Avartita Sneha is available in various Ayurvedic texts. Here some of these from Brihatrayee is described-

Sr. No.	Name of formulation	Number of Avartana	Text	Reference
1.	Amalaka Ghrita	100/1000	Cha. Sam	Rasayana 1/2/4
2.	Bhallataka Taila	100	Cha. Sam	Rasayana 1/2/16
3.	Madhuka Taila	100/1000	Cha. Sam	Chikitsa Sthana 29/116-117
4.	Bala Taila	100/1000	Cha. Sam	Chikitsa Sthana 29/119-20
5.	Sneha Basti	100/1000	Cha. Sam.	Siddhi Sthana 12/19
6.	Bala Taila	100	Sushruta Sam.	Uttar. 21/12-13
7.	Anu Taila	10	Ash. Sam.	Ash. Sam. Sutra 29/9

Research Update

1. Study done by Sarvikara etc on three samples of Guduchi Swarasa to evaluate its adaptogenic activity against forced by swimming induced gastric ulceration and haematological changes in albino rats. The result shows that Guduchi Ghrita has better effect in comparison to Guduchi Swaras- Savrikar SS, Doli V. Ravi Shankar B, Shukla V.- A comparative pharmacological investigation of three samples of "Guduchi Ghrita" for adaptogenic activity against forced swimming induced gastric ulceration and heamatological changes in albino rats. Int. Ayurveda Ras 2010; 1: 67-72
2. Sneha Kalpana is compared with Liposomal drug delivery due to its drug delivery method i.e. general, sustain and control pattern. However various researches are going on its validation.- Singh Na Choudhary A. - A comparative review study of Sneha Kalpana [Paka] vis-a-vis Liposome. Ayu. 2011 Jan; 32(1): 103-8. doi: 10.4103/0974-8520 85740.
3. Patgiri BJetal have found in this study that as the number of Aavartana is increased oil is having semi solid consistency instead of liquid form. Patgiri BJ, Krishnamurti MS, Subrata D, Singh K.- A comparative pharmaceutico-clinical study of 1, 7 and 50 Avarti Ka Ksheer Bala Taila Ayu 2008; 29(1): 19-24
4. Bhrita Jivakadya Taila was studied for Mradu Paka and Madhyama Paka and it was prepared by both of the Paka separately. Analytical results shows that the viscosity of Mridu Paki Taila was 86.93m Pa-s while Madhyama Paki

was 91.93 m Pa-S. Both of these were studied for its efficacy in migraine. The method was double blind Clinical trial. It was found that Madhyame Pake has better result. Singh SK, Rajoriak, Kumar A, Sharma. A Double-blind Controlled clinical trial to evaluate the effects of nasal therapy with Vrihatajivakadya oil on different viscosities in patients with migraine. J Ayurveda Integr Med. 2023 Mar-Apr;14(2):10062:

Market Survey- Taila and Ghrita are used for the preparation of Sneha Kalpana. Tailas are available in the market as a cosmetic and as medicine. Maha Vishgarbha Taila, Anu Taila, Jatyadi Taila etc. are commonly available medicated oil in the market. Hair oils [as a proprietary Ayurvedic medicine are available. These are having big size in terms of variety and turn over. Classical oil like Maha Bhringaraj Taila and proprietary like Kesh Nikara, Kesh King etc. are available in the market. These are also advertised through different media.

Points for market survey on Sneha Kalpana

1. Name of the Product
2. Name of the pharma company (manufacturing it)
3. Total number of pharma company (manufacturing it)
4. Packaging size.
5. Packaging type - pouch packing, bottle packing it.
6. Cost of the product.
7. Availability in the market
8. Distribution channel.

Sandhana Kalpana

Introduction

Madya Kalpana, Asava, Arishta, Sura (Prasanna, Kadambari, Medaka, Jagala, Bakkasa), Maireya, Surasava, Shukta, Kanjika, Sauviraka, Tushodaka, Sidhu Kalpana their methods of preparation, Siddhi Lakshana properties uses, doses. Takrarishta. Draksharishta, Ashokarishta, Dashamularishta, Kumaryasava, Chandrasava. Madya (Alcohol) containing products are described under Anna Pana in Ayurvedic texts. However various formulation that contains alcohol are used in the treatment of different diseases and these are described in respective disease in Chikitsa Sthana of Charaka Samhita or Chikitsa Prakarana of other texts. Madya Varga product contains either alcohol that is ethyl alcohol or Shukta (Acetic acid). Eighty-Four types of Asava which are grouped under nine Asava Yoni by Acharya Charaka is described in twenty fifth chapter of Sutra Sthana, of these Asava Yonis Dhanyasava contains following products.

Significance of Sandhana Kalpana (fermentative preparations)

1. Sandhana preparations contain self-generated alcohol, which acts as self-preservative.
2. Tikshna Guna of Madya helps in quick absorption and assimilation of the medicine.
3. They are known to have infinite shelf life and they get better and better with time in terms of their potency and sharpness provided they are stored properly.
4. As a result, the bio-availability and therapeutic efficacy are more in these preparations.
5. Since these preparations are in liquid form, they may be readily administered in Bala (paediatric) and Vruddha (geriatric cases).
6. They preparations kindle appetite by stimulating the activity of digestive enzymes.
7. The Madhura Dravya (sweetening agents) used in these preparations adds to their good palatable. Some of the sweetening agents like jaggery, sugar, grapes, honey etc. used here are highly nutritive to the body.

Charaka Samhita -In this period, several original revelations were made about preparation of different herbal formulations as medicines. Literary review says that several Asava Arishta were well known to physicians during that period. Charaka Samhita explains that especially the nine herbal sources-Phala (fruits), Dhanya (cereals), Mula (roots), Pushpa (flowers), Twak (bark), Sara

(exudate), Kanda (branches), Patra (leaves), and Sharkara (sugar) for the preparation of fermented medicines, definition of fermentation, specification in the container, place to keep the basic drug, the time period for fermentation, subjective parameters to test elaborately the end point of the procedure and finished product. The application of the prepared medicines (Asava-Arishta) is recommended in different disease conditions.

Sushruta Samhita - Among Ayurvedic basic literature, Sushruta Samhita is considered as the treaty of surgical treatment. A number of Sandhana Kalpana (fermented products) were prescribed for surgical procedures as anesthetic drug as well as a medicine to treat different disease conditions. A total of 21 fermented drugs such as Asava-Arishta and 46 Madya products named as Madya, Sura, Prasanna, Jagala, Surasava, Madhvasava, Shukta, Dhanyamla are well documented in this classical text. Sushruta Samhita may be credited for addition of botanical ash (Apamarga, Palasha ash) as ingredients of Asava-Arishta. These formulations are prescribed for certain therapeutic purposes.

Ashtanga Hridaya and Sangraha - Herbal medicine stream was fully developed in this period; this is reflected in the formulation of different Sandhana kalpana. Along with other ingredients, the use of Dhataki Pushpa (Woodfordia fruticosa) as a fermentation initiator is documented for the first time in Ashtanga Hridaya. This could be considered as one of the innovatory steps in pharmaceutical practice to formulate Sandhana Kalpana. Physicians were well aware of the fermentation techniques, as the container, the place, duration and criteria for testing the product are clearly mentioned in various formulations usually in accordance with previous classics. 'Draksha (grapes), Ikshu (sugar cane), Makshika (honey), Shali (rice), Vrihi (grains) are the five source materials found to be used to prepare Madya and Sandhana Kalpana. Draksha is the most acclaimed source material. A total of 17 Asava-Arishta are quoted in Ashtanga Sangraha and 8 in Ashtanga Hridaya.

Bhaishajya Ratnavali - The information regarding Sandhana formulations is found here as a handbook, which can be simpler in routine use for the physicians. In the preparation of these drugs, the ingredients, the specific duration to keep the container-for 15 days or 1 month-is mentioned. In this book, a total of 50 Sandhana Kalpanas are quoted, of which 15 are Asava, 29 Arishta, 2 Chukra, 2 Sura, 1 Shukta, and 1 Kanji Kalpana.

Ayurvedic Formulary of India - Parts I and II of Ayurvedic Formulary of India describes 40 Asava-Arishta, with complete detail of their pharmaceutics and therapeutics. In this publication by Department of AYUSH, Government of India, the manufacturing process of Asava-Arishta are described in the beginning of the chapter and the ingredients (with their part used) and proportion of all formulae are described systematically.

Definition of Sandhana Kalpana

द्रवेषुचिरकालस्थंद्रव्यंयत्संधितंभवेत् ।
आसवारिष्टभेदैस्तुप्रोच्यतेभेषजोचितम् ॥
(Sha. Madh. 10/01)

Sandhana is the process of fermentation where the Dravadravya (Kwatha, Swarasa or liquid preparation), Madhura Dravya (jaggery, honey or sugar), Prakeshepaka Dravya (fine powders of medicinal drugs) and Sandhana Dravya (Dhataki Pushpa, Madhuka Pushpa as fermentation initiators) are put together in an inert vessel (mud pot) and sealed for a specified time periods to facilitate the process of permutation Asava and Arishta are the two major products of this process.

केवलद्रवद्रव्यंवाभेषजान्नादिसंयुतम् ।
चिरकालस्थितंवैद्यःसन्धानंपरिकीर्त्तितम् ॥
तस्यभेदद्वयंप्रोक्तंमद्यंशुक्तंतथैवच ।
(Dravya. Guna. Vig. Yadav ji)

Sandhana is that in which only Drava Dravya or Drava Dravya mixed with drug or Anna etc. are kept for a long time. It is of two types that is Madya and Shukta.

The word Sandhana is formed as सन्धीयतेयदिति, संन्धा with ल्युट Pratyaya. Amarkosha has given the word Abhishava as a synonym to Sandhana. According to Medini the word Sanghdrinam in

Sandhanarthaka which means mixing of several Dravya together.

Classification

Sandhana Kalpana	
Madya Kalpana (Alcoholic fermentation)	Shukta Kalpana (Acidic fermentation)
Sura- Prasanna, Kadam-abari, Jagala, Mrudvika, Surabija	Shukta
Sidhu	Tushambu
Varuni	Sauvira
Asava Arishta	Kanjika
	Sandhaki

Classification according to Charaka Acharya

Asava Yoni - sources of ingredients for alcoholic preparations are eight Viz,

1. Dhanya - grains (6 preparations)
2. Phala - fruits, (26 herbs)
3. Mula - roots, (11 herbs)
4. Sara - heart woods (20)
5. Pushpa - flowers, (10)
6. Kanda - branches (4)
7. Patra - leaves (2)
8. Twacha - barks (4)
9. Sharkara - sugar (1).

Asava (alcoholic preparations) are innumerable depending upon the ingredients, their combinations and the method of preparation; however, the most wholesome ones out of them are eighty-four in number as follows,

Dhanyasava (six alcoholic preparations made of grains)

Sura, Sauvira, Tusodaka, Maireya, Medaka and Dhanyamla

Phalasava (twenty-six alcoholic preparations made of fruits)

1. Mrudvika (Draksa- Vitis vinifera Linn)
2. Kharjura (Phoenix sylvestrys Roxb)
3. Kashmarya (Gemelina arborea Linn)
4. Dhanvana (Grewina Tiliaefolia Vahl)
5. Rajadana (Mimusops hexandra Roxb)
6. Ketaka/ Trunashunya (Pandanus tectorius Soland)
7. Parushaka (Grewia Asiatica Linn)
8. Abhaya (Terminalia Chebula Linn)
9. Amalaka (Emblica officinalis Gaertn)
10. Mrigelindika/ Bibhitaki (Terminalia belerica Roxb)
11. Jambu (Syzygium Cumini Skills)
12. Kapittha (Foronia limonia Swingle)
13. Kuvala/ Sthula Badari (Zizyphus Jujuba Gaertn)
14. Badara (Zizyphus Jujuba Lam)
15. Karkandhu/ Shrugala Badara (Zizyphus nummularia W.A)
16. Pilu (Salvadora persica Linn)
17. Priyala (Buchanania Lanzen Spreng)
18. Panasa (Artocarpus heterophyllus Lam)
19. Nyagrodha (Ficus bengalensis Linn)
20. Asvatha (Ficus religiosa Linn)
21. Plaksa (Ficus locar Buch Ham)
22. Kapitana (Albizza Labbeck Benth)
23. Udumara (Ficus recemosa Linn)
24. Ajamoda (Trachyspermum Roxburghia-num)
25. Srungataka (Trapa Bispinosa Roxb)
26. Sankhini (Cansocora decussate).

Mulasava (eleven Alcholic preparation made of roots)

1. Vidarigandha (Salaparni -Desmodium Gangeticum DC)
2. Ashwagandha (Withania somnifera Lam)
3. Krushnagandha (Moringa oleifera)
4. Satavari (Asparagus Racemosus Willd)
5. Syama (Operculina turpethum R.B)
6. Trivrta (A variety of Syama)
7. Danti (Baliospermum montanum Muell- Arg)

8. Dravanti (Jatropa glandulifera Roxb)
9. Bilva(Aegle marmelos Corr)
10. Eranda (Ricinus communis Lin)
11. Chitraka (Plumbago Zeylanica Lin)

Sarasava (twenty alcoholic preparation made of heart- wood)

1. Sala (shorea robusta Gaertn.f)
2. Priyaka (Buchanania Lanzan soreng)
3. Asvakarna (Dipterocarpus alatus Roxb)
4. Candana (santalum album Linn)
5. Syandana (Tinisa- Ougeinia Dalbergioides Benth)
6. Khadira/ Shweta Khadira (Acacia Catechu Willd)
7. Kadara (a variety of Khadira)
8. Saptarna (Alstonia scholaris R.Br)
9. Arjuna (terminalia arjuna W and a)
10. Asana (Terminalia tomentosa W and A)
11. Arimeda/ Vit Khadira (a variety of Khadira)
12. Tinduka (Diospyrus Peregrina Gurke)
13. Kinihi/ Apamarga (white variety of Sirisa)
14. Sami(Prosopis spicigera Linn)
15. Shukti (Badari -Zizyphus Jujuba Lam)
16. Shimshapa(Dalbergia sissoo Roxb)
17. Shirisha (Albizzia lebbeck Benth)
18. Vanjula(Saraca indica)
19. Dhanvana(Grewia tiliaefolia)
20. Madhuka (Madhuka indica).

Pushpasava (ten alcoholic preparation made of flowers)

1. Padma/ Rakta Prushtadala (Nelumbo nucifera Gaertn)
2. Utpala (Nymphaea alba Linn)
3. Nalina (a variety of Padma- Nelumbium Sp.)
4. Kumuda(a variety of Utpala- Nymphaea Sp.)
5. Saugandhika (Nymphea Rub)
6. Pundarika/ Shweta Shatapatra Padma (Nymphea lotus Linn)
7. Satapatra/ Rakta Shatapatra Padma (a variety of Kamala- Nymphea Nucifera)
8. Madhuka (Madhuka indica)
9. Priyangu (Calliarpa Macrophylla)
10. Dhataki (Woodfordia fruticosa Kurz).

Kandasava (four alcoholic preparations made of branches)

1. Iksu/ Pundraka (saccharum officinarum Linn)
2. Kandeksu (Saccharum Spontanium Linn)
3. Iksuvalika (Asteracantha longifolia Ness)
4. Pundraka (a type of sugar cane)

Patrasava (two alcoholic preparations made of leaves)

1. Patola (Trichosanthes cucumerina Linn)
2. Tadaka (Borassus Flabellifer Linn)

Tvagasava (four alcoholic preparation made of barks)

1. Tilvaka/ Shabara Lodhra (Symplocos racemosa Roxb)
2. Lodhra (a variety of Tilvaka- Symplocos racemosa)
3. Elavaluka (Prunus cerasus L)
4. Kramuka/Guvakam (Araca catechu Linn)

Sharkarasava (one variety of alcoholic preparation made of sugar)

Thus, eighty-four varieties of Asava Dravya (substance) used for fermentation. They are named as Asava (alcoholic preparation) because of the process of fermentation involved. They are Bahuvidha (many) based on Dravya Samyoga (combination of substance) and Samskara (processing). Asava with proper Samyoga (combination), Samskara (processing) will do its action. By seeing the action of the Asava, one can prescribe Samyoga (combination), Samskara (processing), Desha (place), Kala (time) and Matra (quantity) etc.

Difference between Madhya and Shukta Kalpana

Madya Kalpana (Alcoholic fermentation)	Shukta Kalpana (Acidic fermentation)
Fermentation in this case is carried out by yeast cells	Fermentation in this case is carried out by acid bacilli
Fermentation period is more than 15 days to even up to six months	Fermentation period usually 15 days.
Sweetening agents are added in all the preparations excepting Sura	Fermenting media here mainly are carbohydrates.
Example- 1. Sura- Prasanna, Kadambari, Jagala, Medaka and Surabija 2. Sidhu 3. Varuni 4. Asavarishta	Example- 1. Sukta 2. Tusambu 3. Sauvira 4. Kanjika 5. Sandaki

General method of preparation

It can be categorized into three parts

1. Purva Karma
2. Pradhan Karma
3. Pashchata Karma

1. **Purva Karma-** the following process are included under it
   - Selection of Patra
   - Dhoopana of Patra
   - Lepana of Patra
   - Collection of drugs
2. **Pradhana Karma-**it includes the following steps
   - Preparation of Drava Dravya
   - Mixing of sweetening Dravya
   - Prakshepa Dravya mixing
   - Filling in pot
   - Sealing of pot
   - Placing of pot
   - Left for Sandhana
3. **Pashchata Karma** - It includes
   - Observation for fermentation
   - Filtration
   - Maturation
   - Storage

Essential ingredients for Sandhana Kalpana

1. Drava Dravya- Kwatha, Swarasa, Water
2. Madhura Dravya (Sweetening Dravya)- Guda, Sugar, Honey etc.
3. Prakshepa Dravya - Dhataki Pushpa, Chaturjata, Bhasma etc.

Anukta Mana

अनुक्तमानारिष्टेषुद्रवद्रोणेतुलांगुडम् ।
क्षौद्रंक्षिपेद्तुडादर्धंप्रक्षेपंदशमांशिकम् ॥

(Sha. Madh. 10/3)

If Mana of Guda, Madhu etc. are not mentioned then these are taken as follows:

Drava Dravya	1 Drona (12.288 kgs)
Guda	1 Tula (4.8 kgs)
Madhu	1/2 Tula (2.4 kgs)
Prakshepaka Dravya	1/10 Tula or 1/10 of Guda (0.48 kga)

Sandhana Vidhi

क्वाथादौभेषजद्रव्यंशर्करामधुवागुड्म् ।
सम्यगासवनिष्पत्त्यैकिञ्चित्किण्वंतथैवच ॥
सन्धायस्थापयेज्जातरसंवस्त्रपरिस्रुतम् ।
मांसीमरिचलोहैस्तुप्रलिप्तेधूपितेऽथवा ॥
शुचौभाण्डेमुखंरुध्वास्थापितंभेषजोचितम् ।
आसवारिष्टसंज्ञंतंकल्पमाहुचिकित्सकाः ॥

(Dra. Guna. Vig. Yadav ji)

Kwatha etc. Bheshaja drugs along with Sharkara, Madhu or Guda and Kinwa, for proper manufacturing of Asava, are kept altogether in a clean pot which is Dhoopita and Lepita before transferring of Sandhana Dravya and it is filtered after Jata Rasa (Completion of fermentation). These are known as Asava/Arishta by Chikitsaka.

Observations

Observations at the initial stage (while keeping the fermenting media for fermentation).

1. In the beginning, the Prakshepaka Dravyas (Dhataki Pushpa etc.) will be floating on the surface of the fermenting media (liquid).
2. It will be thicker than water consistency.
3. The temperature of room, husk where the Sandhana Patra is kept should be around 34 Celsius. The temperature of the fermenting media also will be around 34 Celsius.

It is divided into 2 stages :

1. During process of fermentation (after the onset of fermentation)
2. Completion of fermentation (After the completion of fermentation process)

During process of fermentation- The following characters are found.

1. Bubbling sound come from Sandhana Patra
2. Prakshepaka Dravya float over surface of Drava.
3. Mild smell of alcohol comes out from vessel.

Completion of fermentation-

1. Prakshepaka Dravya sinks completely.
2. Gandha, Varna and Rasotpatti occur.
3. Alcoholic smell present
4. No sound comes out from vessel.

Burning candle test- When burning candle is took inside it is extinguished. It indicates liberation of carbon dioxide during process. When burning candle is took inside vessel it remains continue. It indicates completion of process.

Lime water Test— Lime test can also be done for the presence of CO2.

For this purpose, one rubber tube is connected from Sandhana Patra to test tube, which is filled with lime water. This man over facilitates transmission of gas produced in Sandhana Patra to test tube. During this test air bubbles will be seen in lime water and lime water turns in to milky, due to release of CO2 during fermentation (when the fermentation starts, glucose oxidises to alcohol and CO2 due to the enzymatic actions of yeast cells present in the fermenting media. The CO2 thus released produces air bubbles and turns lime water to milky by chemical reaction.

Calcium hydroxide [Ca(OH)2] combines with CO2 and produces white coloured calcium carbonate precipitate [Ca(OH)2 + CO2 = CaCo3 + H2O].

The temperature of fermenting liquid will be found slightly raised. It may reach nearer about 36 to 38 Celsius.

Important factors in Asava Arishta Preparation

Sandhana Patra selection- Patra made up of the different materials are found described.

1. Earthen pot
2. Sagaun wood pot
3. Metallic pot
4. Porcelain Jara
5. Now-a-days plastic tanks are used for production on large scale

It is indicated in the texts that if only Patra word is used then earthen pot should be taken. Earthen pot can be used for Sandhan process. But the same pots cannot be used for more times. Along with big pot may be available frequently for the production of large scale. Pot made up of Saugun wood are very good for Sandhana process and these can be made according to use. Porcelain jars can also be used for Sandhana. Availability of these Patra is not much convenient. Now-a-days food grade plastics tanks are available and these can be used for the process of fermentation. In these tanks at the bottom side there e is stopcock through which prepared Asava/Arishta are taken out. One more advantage is that after the that preparation of Asava/Aristha, Kinva is left within it and it can be used as fermenter for next time.

Dhoopan of Patra- Dhoopan process is indicated for Patra before putting the Drava Dravya into it. The drugs like Agaru, Chandan, Guggulu etc. can be used. For this process the drugs are burnt

so that fumes come out from these. Now these fumes are inserted into the Patra.

Lepana of Patra- Smearing of thin paste of certain drugs is known as Lepana next time. For this purpose, Madhu, Pippali or Ghrita and Pippali is used. Dhoopan and Lepana process are helpful for sterilization of vessel and also needed for the filling of pores present in earthen pot or wooden pot so that liquid do not come out from these pores. It also prevents the entrance of air from outside which may cause spoiling of liquid Dravya.

Place for fermentation- For the fermentation of vessel, Aacharya Charaka and Sushruta has indicated that it is kept in Dhanya Rashi. However, the following references are found regarding it-

1. The vessel up to its neck should be kept inside soil.
2. Vessel up to its half should be kept inside soil (भूगर्भचौगुल्ये).
3. Vessel is kept inside Dhanya Rashi.
4. It is kept on the plane surface

Importance of room temperature- This practice ensured that optimum temperature, direct avoidance of light and air, etc. were maintained. Specific microorganisms require specific temperature for optimum growth and product formation. In general, optimum temperature needed for initiation of fermentation is in the range of 20-35^{0}C.

Sandhana Kala-Different Asavas are kept for different time period for the completion of process.

Adding of honey, Bhasma, Prakshepaka Dravya- Prakshepa Dravyas are added after mixing of Madhura Dravya. However if Prakshepa Dravyas are used then it should be in powder form as Aacharya has used the word चूर्णीकृत for Prakshepaka Dravyas. Acharya Vagbhata has used Dhataki Pushpa along with Madhuka Pushpa are considered as fermentation initiator. If Bhasma is added then it should be Varitara.

Difference between Asava and Arishta

यदपक्वौषधाम्बुभ्यांसिद्धंमद्यंस आसवः।
अरिष्टः क्वाथसिद्धः स्यात्तयोर्मानंपलोन्मितम् ॥
(Sha. Madh. 10/2)

The Madya which is prepared in water without boiling it then it is known as Asava. While Arishta is prepared with Kwatha. Dose of both these is one Pala.

Sr. No.	Asava	Arishta
1.	Generally, it is prepared with Apakva Drava	It is prepared with boiled Drava
2.	Asava are Drava Pradhana	Arishta are Dravya Pradhana
3.	It is prepared usually with majority of Shita Virya Dravya.	It is prepared usually with majority of Ushna Virya Dravya.
4.	Potency is lesser comparatively Arishta.	Potency is more comparatively Asava.
5.	Benefit in Pittaja Vikara	Benefit in Vata Kaphaja Vyadhi
6.	Used in lesser range of Vyadhi	Used in wider range of Vyadhi
7.	Used in paediatric cases also	Used in adult and old age.

Dosage- One Pala (48 ml)

Shelflife-10 years

Draksharista

द्राक्षातुलार्धंद्विद्रोणेजलस्यविपचेत्सुधीः ।
पादशेषेकषायेचपूतेशीतेविनिक्षिपेत् ॥
गुडस्यद्वितुलांतत्रत्वगेलापत्रकेशरम् ।
प्रियङ्गुमुर्मारिचंकृष्णाविडङ्गाचेतिचूर्णयेत् ॥
पृथक्पलोन्मितैर्भागैस्ततोभाण्डेनिधापयेत् ।
समन्ततोघट्टयित्वापिबेज्जातरसंततः ॥
उरःक्षतःक्षयंहन्तिकासश्वासगलामयान् ।
द्राक्षारिष्टाह्वयःप्रोक्तोबलकृन्मलशोधनः ॥
(Sha.Madh. 10/69-72)

Ingredients -Kwatha Dravya

1. Draksha - 2.5 kg
2. Water for Kwatha - 26 litres
3. Reduced up to - 6.5 litres

Prakshepaka Dravyas -

1. Dhataki Pushpa - 250 gm
2. Twak - 50 gm
3. Ela - 50 gm
4. Tejapatra - 50 gm
5. Nagakeshara - 50 gm
6. Priyangu - 50 gm
7. Maricha - 50 gm
8. Pippali - 50 gm
9. Krishna Vidanga - 50 gm

Madhura Dravya - Guda - 10 kg

Method of preparation- Kwatha is prepared by taking Draksha and water. To this prepared Kwatha, Guda (Jaggery) is dissolved and Prakshepaka Dravyas in the form of Churna are mixed into it. It is then left for Sandhana. After completion of Sandhana process, it is filtered and stored well.

Properties- It is used in Urhakshata, Kshaya, Kasa, Shwasa and disease of throat. It is Balakaraka and Mala Shodhaka.

Dose- 1 to 2 Tola with equal water after meal.

Ushiravasa

उशीरं बालकं पद्मं काश्मर्यं नीलमुत्पलम्।
प्रयङ्ग पद्मकं लोध्र मञ्जिष्ठां धन्वयासमम्॥
पाठां किरात तिलञ्च न्यग्रोधोदुम्बरं शरीरम्।
पर्पटं पुण्डरीकं च पटोलं काञ्चनारकम्॥
जम्बूशाल्मलिनिर्यासं प्रत्येकं पलसम्मितम्।
सर्वं सुपूर्णितं कृत्वा द्राक्षायाः पलविंशतिम्॥
धातकी षोडशपलां जलद्रोणे द्वये क्षिपेत।
शर्करायास्तुलां दत्वा क्षौद्रस्यार्द्ध तुलां तथा॥
मासं संख्याववेद् भाण्डे मरिच धूपिते।
उशीरासव इत्येष रक्तपित्त विनाशनः॥
पाण्डु कुष्ठ प्रमेहार्शः कृमिशोथहरस्तथा॥

(Bhaishajyaratnavali Raktapitta)

1. Ushira (Vetiveria zizanioides) - Root - 48 g
2. Hribera (Coleus vettiveroides) - Root - 48 g
3. Padma - Lotus (Nelumbo nucifera) - Flower - 48 g
4. Gambhari (Gmelina arborea) - Root / stem bark - 48 g
5. Neelotpala (Nymphaea stellata) - Flower - 48 g
6. Priyangu (Callicarpa macrophylla) - Flower - 48 g
7. Padmaka (Prunus cerasoides) - Stem - 48 g
8. Lodhra (Symplocos racemosa) - Stem bark - 48 g
9. Manjishta (Rubia cordifolia) - Root - 48 g
10. Dhanvayasa (Fagonia cretica) - Whole plant - 48 g
11. Patha (Cissampelos pareira) - Root/whole plant- 48 g
12. Kiratatikta (Swertia chirata) - whole plant - 48 g
13. Nyagrodha - Vata (Ficus benghalensis) - Root / stem bark - 48 g
14. Udumbara (Ficus racemosa) - Root / stem bark - 48 g
15. Shati (Hedychium spicatum) - Rhizome - 48 g
16. Parpataka (Fumaria parviflora) - whole plant- 48 g
17. Pundarika - Kamala (Nelumbo nucifera) - Flower - 48 g
18. Patola (Trichosanthes dioica) - Leaf / whole plant - 48 g
19. Kanchanara (Bauhinia variegata) - Stem bark - 48 g
20. Jambu (Jamon seeds - Syzygium cumini) - Stem bark - 48 g
21. Shalmali (Salmalia malabarica) - Exudate - 48 g
22. Draksha - Raisins - Dried fruit - 960 g
23. Dhataki (Woodfordia fruticosa) - Flower - 768 g
24. Water-24.576 liters

25. Sharkara - Sugar - 4.8 kg
26. Kshaudra - Honey - 2.4 kg
27. Jatamamsi (Nardostachys jatamansi) and Maricha (Black pepper fruit) - fine powder - quantity sufficient.

Method of preparation -A mud pot is taken. It is fumigated with the powders of Jatamansi and Maricha. Pure water in the said quantity is taken in the vessel, added with the powders of the rest of the ingredients, sugar and honey. The contents are kept closed air tight for one month period, for fermentation. After a month time, it is filtered and preserved.

Dose- 12-24 ml with water

Alcohol- it contains about 4-9 percentage.

Points for market survey

1. Name of the Product
2. Name of the pharma company (manufacturing it)
3. Total number of pharma company (manufacturing it)
4. Packaging size.
5. Packaging type - pouch packing, bottle packing it.
6. Cost of the product.
7. Availability in the market
8. Distribution channel.

Pathya Kalpana

A good and proper diet in disease is worth a hundred medicines and no amount of medication can do good to a patient who does not observe a strict regimen of diet. Pathya is derived from word Patha means the path. Pathya is defined as the factor which is conducive to body and mind.

Definition

पथ्यं पथोऽनपेतं यद्यच्चोक्तं मनसः प्रियम्।
यच्चाप्रियमपथ्यं च नियतं तन्न लक्षयेत्॥

The Ahara Vihara which is beneficial and nutritional to the body and also give the happiness to the mind is known as Pathya and opposite to this is known as Apathya.

This should not be neglected. The root term of Pathya is "patha" means various channels in body & "Anepetam" means not causing any harmful for body channels and on the contrary which is wholesome - soothing for body can be labeled as Pathya. Pathya means belonging to the way, suitable, fit or proper, Pathya, salutary & especially diet in medical science. Ahara & Vihara which is not harmful to the body & body channels is called as Pathya. Ahara & Vihara which is helpful to whole body is Pathya. The Pathya Ahara & Viharas which is pleasant to the mind is known as Pathya.

Significance of Pathya- Acharyas indicated the importance of Pathya Ahara by stating that if a patient intake wholesome food then there is no need of medicine and if a patient continuously consumes unwholesome food then also there is no need of medicine. In the latter case, medicine will not be effective. In this way, the precisely constituted, calculated and cooked food is known as Pathya. It is said to be Mahabheshaja by Acharya Kashyapa. The ways to overcome to disease and also maintenance of good health are the two main Prayojana of Ayurveda. Bheshaja, Ahara and Vihara are essential part of Chikitsa. Ahara and Vihara are essential part of parcel of human life. Ahara has a significant mentioning in Pathya - Apathya.

The food and drug which do not adversely affect the body as well as mind are considered as wholesome and those which adversely affect these are known as unwholesome. The importance of Pathya & Apathya in Ayurveda can be deduced from the fact that Charaka had stated Pathya a synonym for treatment. Charaka stated that when channels of circulation become hard by aggravated & vitiated Dosha, Pathya helps to soften the Srotasa & Dosha alleviation. Charaka had elaborately described the concept of Pathya and Apathya. He had given a general list of Pathya and Apathya Dravya for patients. Charaka had also given equal importance of Pathya Vihar along with Pathya Ahara for maintenance of health as Charaka has

stated that in condition of Chinta, Shoka, Krodha, Dukha Shaiya, Ratri Jagrana, even the small amount of Pathya Ahara is not digested thus have given equal importance of both Pathya Ahara and Vihara. Further Sushruta had specifically written a chapter named Hita-Ahitiya Adhyaya in Sutra Sthana.

Pathya Kalpana must be used in Dinacharya, Rutucharya. It is very much necessary for the patients to have the food which will keep their Dhatus in a healthy state and will not let them

get vitiated more from Doshas. Pathya is that which brings the vitiated Doshas to normalcy and Apathya are those which causes vitiation and abnormalities in the Doshas. The Pathyas should be administered in various Kalpanas such as Manda, Peya, Vilepi etc and the forms of these Kalpanas should be altered according to needs of person, disease and time.

According Acharya Sushruta four preparation are called as Pathya- Manda, Peya, Yavagu and Vilepi.

Types of Pathya

Manda

सिक्थैर्विरहितो मण्डः पेया सिक्थसमन्विता।
विलेपी बहुसिक्था स्याद्यवागूर्विरलद्रवा॥
(Su. Su. 46/344)

When rice boiled properly with water, the obtained liquid portion is called Manda.

मण्डस्तुत्रिविधोंज्ञेयएकद्विप्रिपरिसुतः ।
लाजैर्भृष्टैरभृष्टैवतण्डुलैःपरिसंस्कृतः ।

Munda is of three types depending upon cleaning frequency that is one, two or three times by taking fried Laja, Laja without fry and Tandula.

General method of preparation

नीरेचतुर्दशगुणेसिद्धोमण्डस्त्वसिक्थकः ।
शुण्ठिसैन्धवसंयुक्तः पाचनो दीपनः स्मृतः॥
(Sha. Madh. 2/172)

One part of rice and fourteen parts of water are boiled together, when rice is boiled properly, the contents are filtered and obtained liquid portion is called Manda Kalpana. This fluid mixed with powder of Shunthi and Saindhava Lavana is a good Dipana and Pachana.

मण्डस्तु दीपयत्यग्निं वातं चाप्यनुलोमयेत्।
मृदूकरोति स्त्रोतांसि स्वेदं संजनयत्यपि॥
लङ्घितानां विरिक्तानां जीर्णे स्नेहे च तृष्यताम्।
दीपनत्वाल्लघुत्वाच्च मण्डः स्यात् प्राणधारणः॥
(Cha. Su. 27/251-252)

Manda is water part of the gruel. It stimulates the Agni (power of digestion) and Vata Anulomana (facilitates the downward movement of flatus). It is Mrudu Karoti Stritamsi (softens the channels of circulation), Sweda Sanjanaya (produces sweating). By virtue of its Laghu (lightness) and the Viriktanam Jirna (capacity to promote digestion), Manda (gruel water) is Prana Dharana (sustainers of life) of those who have undergone Langhana (fasting) and Vamana (emesis therapies) and those who are suffering from Trushna (excessive thirst), After Snehapana (consuming oil/ fat), Peya (gruel water) is best.

Vatya Manda

सुकण्डितैस्तथाभृष्टैर्वाट्यमण्डोयवैर्भवेत् ।
कफपित्तहरःकण्ठयोरक्तपित्तप्रसादनः॥
(Sha. Madh. 2/171)

Manda prepared with broken and fried Yava grain is known as Vatya Manda. It is Kapha Pittahara, Kanthya and Rakta Pitta Prasadaka properties.

Laja Manda

लागैर्वातण्डुलैभृष्टैर्लाजमण्डः प्रकीर्तितः ।
श्लेष्मपित्तहरोग्राहीपिपासाज्यरजिन्मतः॥
(Sha.Madh. 2/174)

लाजमण्डोऽग्निजननो दाहमूर्च्छानिवारणः॥
मन्दाग्निविषमाग्नीनां बलस्थविरयोषिताम्।
देयश्च सुकुमाराणां लाजमण्डः सुसंस्कृतः॥
(Cha. Su. 27/254-255)

Manda prepared with fried Laja or rice is known as Laja Manda. It is Shleshmahara, Pittahara, Grahi, Pipasa and Jwara Nashaka.

Laja Manda (Thick gruel of paddy) promotes

Agni (digestion) and cures Daha (burning sensation). Susamkruta Laja Manda given to Sukumar person.

Peya

General method of preparation

द्रवाधिका स्वल्पसिक्था चतुर्दशगुणे जले ॥
सिद्धा पेया बुधै ज्ञेया...
(Sha. Madh. 2/167)

When rice and water in the proportion of 1:14 is cooked then the recipe having more liquid und less rice is known as Peya.

क्षुत्तृष्णाग्लानिदौर्बल्यकुक्षिरोगज्वरापहा ।
स्वेदाग्निजननी पेया वातवर्चोनुलोमनी ॥
(Cha. Su. 27/250)

Peya is prepared by using Shuka Dhanya, it is useful in Kshut (excess hunger), Trushna (excess thirst), Glani (tiredness) Daurbalya (weakness), Kukshiroga (abdominal disorders), Jwara (fever). It promotes Sweda (sweating). It is Agnijanani (digestive) and is Vata Varcho Anulomani (conducive to downward movement of the flatus and fasces).

Yavagu

Types

According to Achary Chakrapani depending upon Dravya, Yavagu is of two types-

1. Prepared with Virya Pradhana Aushadha Dravya
2. Prepared with Rasa Pradhana Ahara Dravya

Virya Pradhana Aushadha Dravyas are of three types-

1. Tikshana Virya Dravyas like Shunthi, Pippali etc.
2. Madhya Virya Dravya like Bilva, Agnimantha, Shyonaka etc.
3. Mridu Virya Dravya like Amalaki etc.

These are boiled in following manner as per Agnivesha

कर्षार्धंवाकणाशुण्योः कल्कद्रव्यस्यवापलम् ।
विनीयपाचयेद्युक्त्यावारिप्रस्थेनचापरम् ॥

That is 1/2 Karsha Tikshana Virya Dravya in 64 Tola of water.

One Pala of Mrudu Virya Dravya in 64 Tola of water

1/2 Pala of Madhya Virya Dravya in 64 Tola of water.

Preparation of Yavagu with Rasa Pradhana Ahara Dravya

क्वाथ्यद्रव्याञ्जलिंक्षणंअपयित्वाजलाढके ।
अर्धवृतेनतेनाधयवाग्वाद्युपकल्पयेत् ॥

Kwatha Dravya in one Anjali (16 Tola) quantity is boiled with one Aadhaka (256 tola) of water and it is boiled till half quantity is remained, By this liquid Yavagu should be prepared.

If Yavagu is prepared by taking Kalka then its definition is according to Suda Shastra as follows:

अन्नंपञ्चगुणेसाध्यंविलेपीचचतुर्गुणे ।
मण्डश्चतुर्दशगुणेयवागूःषड्गुणेऽम्भसि ॥

Anna is 5 times, Vilepi in 4 times, Manda in 14 times and Yavagu should be prepared by taking 6 times of water.

Note- If we compare the method described by Aacharya Chakrapani and Sharangdhara then it is cleared that Yavagu is prepared by two methods. First with the Kwatha of drugs and other only with water. When Yavagu is prepared only with water then six times of water is taken and Yavagu is prepared. If Yavagu is prepared by taking Kwatha then Kwatha is prepared according to Virya of drug. After that from the Kwatha Yavagu is prepared as per Sha.Madh. 2/52.

According to Acharya Kashyapa

द्रवाद्विंशतिभागेनतण्डुलैःसहसाधयेत् ।
तथापञ्चदशाख्येनयवागूदंशकेनवा ॥
(Kashyapa. Khil. 4/72)

Rice and water (or any liquid) in the ratio of

1:20 are taken to prepared Yavagu. It may also be prepured by taken 15 times or 10 times of water (or liquid).

General method of preparation

According to Sharangadhara

साध्यंचतुष्पलंद्रव्यंचतुः षष्टिपलेऽम्बुनि ।
ततक्याधेनार्थशिष्टेनयवागूंसाधयेद्यनाम् ॥
(Sha. Mad. 2/52)

4 Pala Drava is boiled in 64 Pala of water when half amount of water is left then Yavagu is prepared with this amount of water which is Ghana in consistency.

Annavata preparation of Yavagu

अधान्नप्रक्रियात्रैवप्रोच्यतेनातिविस्तरात् ।
यवागूःषड्गुणजलेसिद्धास्यात्कृशराघना ॥
तण्डुलैर्मुद्रमाषैश्चतिलैर्धासाधिताहिता ।
(Sha.Mad. 2/164-165)

Yavagu is prepared with six times of water.

Note-In this commentary Aadhmalla has said that Yavagu Drava and Krishara should be Ghana.

Vilepi

General method of preparation

विलेपी घनसिक्था स्थासिद्धा नीरे चतुर्गुणे ।
तर्पणी बृहणी हृद्या मधुरा पित्त नाशिनी।
(Su. Sutra. 46/341)

Vilepi is prepared with one part of grain (rice) and four parts of water cooked into a thick paste form (till water portion get evaporated). According to taste Manda, Pippali, Saindhava Lavana etc. are added in appropriate quantity while consuming.

Vilepi Guna-Tarpana, Bruhani Hrudya, Madhura and Pitta Nashani

तर्पणी ग्राहिणी लघ्वी हृद्या चापि विलेपिका ।

Vilepi (Thick gruel) is Tarpani (refreshing), Grahini (bowel binding), Laghu (light) and Hrudya (good for heart).

Anna or Odana Kalpana

General method of preparation

अनंपञ्चगुणेसाध्यं **(Dalhana)**

Anna is prepared by taking rice and water into ratio of 1:5 and it do not have Drava.

Note-Acharya Bhava Mishra has said that the words like Bhakta, Anna, Andha, Kura, Odana, Bhissa and Deedivi are synonyms. So, Anna Kalpana may be taken as synonyms to Bhakta. But Shrangdhara has used 14 times of water for the preparation Bhata and Dalhana and Bhava Mishra has indicated 5 times of water for the preparation of Anna Kalpana. So, on this basis both are different.

अद्रवाणिसिक्थानि-ओदन
(Hemadri on Ash. Hri 6/26)

Odana contains Siktha without liquid.

भक्तमन्नं तथाऽन्धश्च क्वचित्कूरं च कीर्तितम् ।
ओदनोऽस्त्रीखियांभिस्सा दीदिविः पुंसिभाषितः ॥
(B.P. Kritanna Varga)

Bhakta, Anna, Andha, Kura, Odana, Bhissa and Deedivi are synonyms:

Types and general method of preparation of Bhakta Kalpana-It is two types

1. Sudhanta and Prasruta.
2. Adhauta and Asruta.

1. Sudhanta and Prasruta

सुधीतांस्तण्डुलान्स्फीतांस्तोयेपञ्चगुणेपचेत् ।
तदुक्तंप्रश्रुतंचोष्णांविशदंगुणवन्मतम् ॥
(Bha. Pra.)

1. Cleaned rice is boiled with 5 times of water then its Manda is decanted and obtained rice is Sudhanta and Prasruta Bhakta. It is having Vishada Guna.
2. When rice is not cleaned with water and Bhakta is prepared. Its Manda does not decant. It is known as Adhauta and Ashruta.

अधौतमसुतंशीतंगुर्वरुच्यंकफप्रदम् ।

(Bha. Pra, Kritanna Varga)

It is Sheeta, Guru and Kapha Vardhaka.

Note-According to Adhamalla Bhakta is of two types

1. Sudhatu Prasruta- It is prepared by taking 14 times of water
2. Adhauta Asruta- It is prepared by taking 5 times of water

Krishara

General method of preparation

यवागूःषड्गुणजलेसिद्धास्यात्कृशरावना ।
तण्डुलैर्मुद्रमाषैश्चतिलैर्वासाधिताहिता ॥

(Sha. Madh. 2/165)

Krishara is prepared with the ingredients like Tandula, Mudga, Masha, Tila and 6 times of water. It's consistency or final appearance should be Ghana (no liquid should be present).

The ratio according to Adhamalla is as follows:

1. Rice-2 Part
2. Masha-1 Part
3. Tila-1/2 Part
4. Water- 6 times to combined quantity of all three ingredients.

तण्डुलादालिसम्मश्रालवणाद्रकहिङ्गुभिः ।
संयुक्ताः सलिलेसिद्धाः कृशराकथिताबुधैः ॥

(Bha. Pra. Krittana)

The recipe which is prepared by mixing of Tandula, Pulses, Lavana Aardraka Hingu and boiled with water is known as Krishara.

Yusha

Types- Yusha can be of following types.

1. According to Rasa
2. According to Dosha
3. According to Yapana
4. According to Kritakrita
5. Depending upon Virya
6. According to combination of Dravya

1. According to Rasa

यूषाः कषायमधुराकषायाम्लाश्चभार्गवः ।
द्विविधाविहिताः सर्वेसर्वेचद्रवयोनयः ॥

(Kash. Khil 4/24)

It is of two types

1. Kashaya Madhura
2. Kashaya Amla

पञ्चविंशतिरित्येतेयूषाःकाश्यपनिर्मिताः ।

Both of these are 25 types. So total number becomes as 50.

2. According to Dosha

दोषभेदेनयूषास्तेसंख्याताःपञ्चसप्ततिः ॥

(Kash.Khil. 4/28)

According to types of Dosha Yusha are 75 in number. Vata, Pitta and Kapha 3x25=75 types.

3. According to Yapana

Yapana that is Sadhya, Yapaya and Ansadhya it is 75 in number (25x3-75)

4. Kritakrita Bheda

कृताऽकृताऽकृतकृताः पित्तश्लेष्मानिलात्मसु ।
रोगेषुस्नेहयोगाच्चतेचूपास्त्रिविधाः स्मृताः॥

(Kash. Khil. 4/25)

According to Sneha yoga in Vataja, Pittaja and Kaphaja diseases, Yusha is of three types.

1. Krita 2. Akrita 3. Kritakrita

5 and 6 According to combination of Virya and Dravya

त एव पाचनाः प्रोक्ताः कर्षणबृंहणा स्तथा ।
शीतोष्णमिश्रवीर्यत्वान्नानाद्रव्योपसंश्रयात् ॥

(Kash. Khil. 4/26)

With the combination of Sheeta and Ushna Virya Yusha are of three types while due to combination of various Dravyas it is of Pachana, Karshana and Brimhana types.

General method of preparation

कल्कद्रव्यपलंशुण्ठीपिप्पलीचार्धकार्षिकी ।
वारिप्रस्थेनविपचेत्यद्रवोयूषउच्यते ॥

(Sha. Madh 2/154)

By taking One Pala of Dravya as Kalka and Shunthi Pippali in half Karsha then boiling it into one Prastha of water. After cooking it is filtered the obtained liquid is known an Yusha.

द्रवाधिखास्वल्पसिक्याचतुर्दशगुणेजले ।
सिद्धापेयाबुधैर्जेयापूषः किंचिद्धनस्ततः ॥
(Sha. Madh. 2/167)

Yusha is prepared by taking 14 times of water and it is somewhat concentrated.

एष यूषः केवलमुद्गकृतइतिसामान्येनास्यकेचित्।

This type of Yusha is made with Mudga.

यतोमुद्ररसइतिलोकेअत्रापिचतुर्दशगुणंजलदेयम् ।
अन्नपरिणाममात्यूषइतिसामान्येनास्यबहवोभेदाः
सन्तितेचाष्टादशगुणेजलसाध्याइति ।

It is prepared with 14 times of water. But if it is made according to Anna Paribhasha then 18 times of water is taken.

Takra

Types- According to Aacharya Charaka it is of three types-

रूक्षमर्धोघृतस्नेहंयतश्चानुद्धतंघृतम् ।
तक्रंदोषाग्निबलविर्त्तिविधंतत्प्रयोजयेत् ॥
(Cha. Chi. 14/84)

1. Ruksha Takra- Completely butter will be separated
2. Ardhodhrita- Half of the quantity of butter will be separated.
3. Anudhrita- It will be prepared without separating butter.

According Bhava Prakash- Depending on cream (Sneha) and quantity of water which is being mixed in Curd. It is of five types

घोलेतुमथितंतंर्कमुदश्विच्छच्छिकाऽपिच ।
(B.P. Takra Varga)

General method of preparation-

मन्थनादिपृथाभूतस्नेहमर्धोदकंचयत् ।
नातिसान्द्रद्रवंतक्रं .....
(Su. Sutra. 45/85)

After churning of Dadhi when its Sneha is taken out and half of water (To the quantity of Dadhi) is mixed into it then it is known as Takra.

तक्रंपादजलंप्रोक्तं (B.P. Takra varga)

According to Bhava Prakash when one fourth quantity of water is added (To the quantity of Dadhi) to Dadhi then it is known as Takra.

ससरं निर्जलं घोलं मथितं त्वसरोदकम् ।
तक्रं पादजलं प्रोक्तमुदश्चित्त्वर्धवारिकम् ।
छच्छिका सारहीना स्यात्स्वच्छा प्रचुरवाचरिका ॥
(B.P. Takra Varga)

1. **Ghola**-When Dadhi is churned with Sara (Cream) without mixing water then it is known as Ghola.
2. **Mathita**- When cream is removed and it is churned without mixing water.
3. **Takra**- When Dadhi is churned by mixing one fourth quantity of water and cream isremoved.
4. **Udashvita**-When half amount of water (to the quantity of Dadhi) is added and it is churned with Sneha (Cream). Then it is known as Udashvita.
5. **Chhachchhika**- After removing cream when more quantity of water is added to Dadhi then it is known as Chhachchhika.

Khada Kambalika

Khada and Kambalika are special type of Yusha. For the preparation of Yusha water is taken while Khada is prepared with Takra and Kambalika is made with Mastu as liquid media. Dalhan on Sushruta Sutra Sthana has commented as follows:

तत्रखडोद्विविधः - सतक्रशमीधान्यः, सतक्रशाकश्च। तथादि-सतक्राणिशमीधान्यानिस्निग्धानिसंग्राहकाणिखडानिठ इति । सतक्रशाकस्तु ठ कपित्थतक्रचाङ्गेरीमरिचाजाजिचित्रकैः। सुपक्वःखडयूषोऽयमथकाम्बलिकोऽपरः।

Khada is of 2 types :

1. Satakra Shami Dhanya
2. Satakra Shaka

General method of preparation

1. **Satakra Shami dhanya**- These types of Khadas are prepared with Shami Dhanya like Mudga, Masha etc. Sneha Dravya like Ghrita. These are cooked in Takra. Then Ghrita, Jeeraka, Lavana, Shunti etc. are added to it and used.
2. **Satakra Shaka**- These types of Khada are cooked in Takra. Then Kapittha, Changeri, Maricha, Jeeraka, Chitraka moola and Lavara are added according to need.

According to Chakrapani

तक्रकपित्थचाङ्गेरीमरिचाजाजिचित्रकैः ।
सुपक्वः खडयूषोऽयमयंकाम्बलिकोऽपरः॥
(Chakrapani, Atisara Chikitsa 29)

Yusha prepared with Takra, Kapittha, Changeri, Maricha, Jeeraka and Chitraka is known as Khada.

According to Jejjata

तिलंसुलुश्चितकृत्यापिष्टंक्षीरेत्र्यहोषितम् ।
पटेपूतंपचेद्धीमानार्द्रकावापितेघृते ॥
मरिचाजाजिसामुद्रैर्युक्तस्तिलखडोभवेत् ।

Tila is ground well with milk and it is left for three days. Then milk is filtered and boiled. From this milk curd is made. To this curd Ghrita, Adraka, Maricha, Jeeraka and Samudra Lavana is added. It is known as Tila Khada.

Kambalika

दधिमस्त्वम्लसिद्धस्तुयूषःकाम्बलिकःस्मृतः ।
पुनःसौवर्चलाजाजीबीजपूरकसौरभैः ॥
संयोज्यमथितःस्वच्छएवकाम्बलिकोभवेत् ।
(Dalhana)

Yusha which is cooked into Dadhi Mastu is known as Kambalika. Shamidhanya is cooked in Dadhi Mastu and Sauvarchala Lavana, Jeeraka, Bijaura Nimbu Swarasa and flavouring drugs like Ela, Lavanga, Teja patra is added to it. It is known as Kambalika.

तक्राम्लसिद्धःकाम्बलिकः, अम्लानां, बहुत्वात्।
(Dalhana on Su. Sutra 46/376)

Due to cooking in Takramla, Kambalika is Amla dominant.

Raga Shadava

General method of preparation

क्वथितंतुगुडोपेतंसहकारफलंनवम् ।
तैलनागरसंयुक्तविज्ञेयोरागबाडवः ॥

Unripen mango fruit is boiled with water. To this Kwatha Jaggery, Taila and Shunthi is mixed. It is Raga Shadava.

Types- Churna Shadava

कोलाम्रचूर्णसितयासमेतंसन्मातुलुङ्गाम्ररसेनसिक्त्वा ।
पुनः पुनः सूर्यकरैर्विशोषितः सिन्धूत्थयुक्चूर्णकखाड-वोऽयम् ॥ (GN. Arochaka 13/20)

Shadava prepared with Krishna Jeeraka, Shweta Jeeraka, Draksha, Tintidaka, Dadima, Sauvarchala Lavana, Karvi with Guda and honey is known as Draksha Shadava. It is popular for Mukha Shodhana. It alleviates all types of Arochaka.

Gutika Shadava

कपित्थकाम्राणिसदाडिमानिपिष्टानिसूक्ष्मंसितयायुतानि ।
सबीजपूराम्बुविभावितानिसन्तर्पणोऽयंगुटिकाख्यखाडवः॥
(G.N. Vaji 105)

Kapittha fruit, Amra and Dadima are ground well. Then fine powder of sugar is added to it. Now it is levigated with juice of Bijapura. It is in the form of Gutika and known as Gutika Shadava. It is having Santarpana property.

Related Research updates

1. Dietetic preparations mentioned in Ayurvedic texts can be used as food supplements for ill patients. Yavagu and Manda contains the main ingredients as rice, Yusha (Main ingredients as pulse), Raga Shadava (Main ingredients are sugar, rock salt and juice of pomegranate). Such food preparations provide nutrition as well as it contains various medicinal plants, fruits, vegetables, oil etc. which may be useful to improve the quantity of life of patients and

serve as a medicinal diet.

2. Providing right gut environment with right diet can help to establish the right microbiomeent, which can have significant metabolic benefits and help to boost immunity and help to prevent infections. Ayurvedic Pathya Kalpana may have significant role in providing nutrition, food satisfaction and health benefits in various ailments in quick and affordable way.
3. Using spices in food preparation has many health benefits like digestive stimulant action, bio-enhancer, hypor-lipidemic effect, anti-diabetic influence, anti-oxident potential, anti-inflammatory property etc.
4. 'Pathya Aaharar Kalpana' makes our food healthy and suitable. It is helpful in the both the conditions viz: Swastha (Healthy) and Atura (Diseased). It is Ayurved's approach that the Jataharagni (Digestive capacity) of the patients is equally important to those properties of Aushadha. It also makes the food pleasurable thus acting over both Physical and mental.
5. Dietary supplements and herbal remedies are popular complementary or alternative products for people. These are the supplements that are intended to supplement the diet and contain one or more dietary ingredients (Including vitamins, minerals, herb or other botanicals amino acids and other substances) or their constituents.
6. The dietary preparation are more balanced and provide all the nutrients which help in allying the disease. Moreover, the condiments used in Pathya Kalpana have been described as curative of various diseases.

Market Survey of Dietary Supplement

Globally, nutraceuticals and dietary supplements are gaining importance and are rapidly becoming part of the consumer's regular diet. This is due to the increasing prevalence of lifestyle diseases such as heart diseases and obesity, as well as consumers consciously taking preventive healthcare measures. Consumers are seeking a more proactive strategy for "improving health through foods," thus preferring healthy and nutritious food items. Furthermore, economic growth is expected to provide growth and diversification for functional food & beverage products, which, in turn, is driving the nutraceuticals & dietary supplements market. The consumption of nutraceutical products provides various health benefits such as cognitive, gut, heart, bone, immunity nutrition, and weight management, among others.

Various nutraceutical ingredients, including probiotics, proteins, and amino acids, phytochemical & plant extracts, fibers & specialty carbohydrates, omega-3 fatty acids, vitamins, prebiotic, carotenoids, minerals and glucosamine, chondroitin, and polyols are being increasingly used for food & beverage products, such as snacks, confectionery, bakery, dairy, meat & meat products, baby food, energy drinks, juices, and health drinks.

Dietary supplements are the products that contain a "dietary ingredient," which is intended to supplement the diet. These dietary ingredients include vitamins, herbs, minerals, botanical ingredients, amino acids, enzymes, metabolites, and many more. These supplements are offered in many forms, such as tablets, capsules, gel caps, liquids, soft gels, or powders; irrespective of their forms, they are marketed as "foods" and not drugs. Probiotics, sports nutrition, omega, meal replacement, vitamin B, and Vitamin D are some The perceived health benefits were commonly cited as the reason for taking nutraceuticals Hectic consumer lifestyles, together with the increasing incidences of chronic diseases, are propelling the market growth, as they are the cause of frequent digestive issues, skin or hair fall issues, and sleep issues, among others. Fortified foods, plant proteins, and dairy alternatives are penetrating the market through different flavors and other organoleptic properties, which are used to enhance food & beverage products. Although acceptance is more evident in developed economies, the increasing purchasing power of consumers is

expected to increase the demand in developing countries.

Market Survey can be done on following points

1. Dietary supplement market by type- e.g. Botanicals, Vitamins, minerals, amino acid probiotics, enzymes.
2. Form - Tablet, Capsule Granules, lincutus etc.
3. Function - Regumiator, body builder
4. Health application
5. Target consumer - Chilohera, women elderly person etc.
6. Distribution channel (Pharmacy, Supermarket/ Hyper market online)
7. Geography
8. Global forecast

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8 CHAPTER

Rasa Dravya Parichaya-I

Syllabus

Rasa Dravya Parichaya- I : Synonyms, mineralogical identification, sources, types, Grahya and Agrahyata, doshas, Shodhana, Marana andother processing techniques, Probable Physicochemical Changes, importance of temperature while processing , Yoga, Research updates of the following

Must to know Drugs : Parada (mercury), Abhraka (Biotite Mica), Makshika (Chalco-pyrite), Shilajatu (Asphaltum Punjabianum), Gandhaka (Sulfur), Gairika (Red Ochre), Kankshi (Alum), Haratala (Orpiment), Manahshila (Realgar), Kampillaka(MallotusPhilippinensis), Navasadara (Ammonium chloride), Hingula (Red Cinnabar), Swarna (Gold), Rajata (Silver), Tamra (Copper), Loha (Iron), Mandura (rust iron), Vanga (Tin), Naga (Lead), Yashada (Zinc), Mukta (Pearl),Pravala (Coral), Vajra (Diamond), Kaparda (Cowries), Shukti (Oyster Shell), Shankh (Conch Shell), Godanti (Gypsum), Samudraphena (Cattle Fish bone), Kukkutandatwak (Hen's Egg Shell) and Tankana Kshara (Borax)

Learning objective

1. Enlist synonyms of Rasadravya and explain significance of that
2. Explain classical & Mineralogical identification and Sources ofRasadravyas
3. Discriminate types, Grahya-Agrahyata and Dosha of Rasadravya
4. Explain Shodhan and Marana and other processing techniques ofthe Rasa- Dravya.
5. Discuss probable physical, chemical changes occuring during
6. process & after Shodhana and Marana of Parada, Haratala,Tamra and Shankha.
7. Explain research updates about Shilajatu,Naga,Mukta andKapardika
8. Discuss probable physical, chemical changes occurring afterBhavana, Puta & whole process of Bhasma nirmana fromRasadravyas
9. Enlist Kalpas prepared from these Rasdravyas and therapeutic importance of that Rasadravya
10. Develop checklist for identification of genuine rasadravyas

Total - 16 hours (Lecture :12 hour, Non-lecture: 04 hours)
Marks- 10 marks, LAQ (10 Marks)- Yes, SAQ (5 Marks)- Yes, MCQ- Yes

1. Parada (Mercury)

Introduction- Parada is one of the main components of Rasaushadhi preparation, which has specific properties like Rasayana and Yogavahi etc. It is inseparable component in most of the metallic and herbo-mineral preparations.

Synonyms-

The various synonym of Parada can be categorised as follows.

1. **Gatyatmaka-** Denote the Gati/Chanchalatya of Parada : (i) Khechara, (ii) Chapala, (iii) Dhurtaka, (iv) Chala
2. **Devatmaka-** Parada is originated from God Shiva the various names indicate this- (i) Trinetra, (ii) Lokesha, (iii) Shiva Virya, (iv) Trilochana, (v) Dehaja, (vi) Dev, (vii) Prabhu, (viii) Bijendra, (ix) Rudraj, (x) Shant, (xi)

Budha (xii) Shantah, (xiii) Rajswal, (xiv) Shivah, (xv) Skanda, (xvi) Shivadwaya, (xvii) Shivabija, (xviii) Harteja, (xix) Harreta (xx) Skandashaka.

3. **Related to Darshana**

(i) Jaiva, (ii) Jiva, (iii) Divya, (iv) Achintya

4. **Related to Dehavadatmaka**

(i) Amritam, (ii) Parmamritam, (iii) Parada, (iv) Parata, (v) Jaitra, (vi) Dehada, (vii) Rasayana, (viii) Rasayuana Shrestha, (ix) Mritunasaka.

5. **Related to Dhatuvada**

(i) Maharasa, (ii) Rasa, (iii) Rasendra, (iv) Mishraka, (v) Suta (vi) Sutaka, (vii) Rasesha, (viii) Rasotama, (ix) Suta Rata, (x) Rasa Dhatu (xi) Rasa Nath, (xii) Rasa Leha, (xiii) Divya Rasa, (xiv) Rasa Raj, (xv) Siddha Dhatu.

6. **Related to Svarupa (Appearence)**

(i) Galad Raupya Nibham, (ii) Svarna, (iii) Maha Vahin, (iv) Chamar, (v) Mahatej

7. **Special character**

(i) Anant, (ii) Amar, (iii) Sukshma, (iv) Saubhagya, (v) Yashad, (vi) Kalikantaka

Mineralogical identification

Phase	Liquid
Symbol	Hg
Colour	Shining silvery white
Atomic number	80
Atomic weight	200.6
Sp. Gravity	13.6
Melting point	-38.83c
Boiling point	356.73
Valency	+1:+2
Heat of fusion	2.29kj.mol-1
Heat of vaporization	59.11kj.mol-1
Specific heat capacity 25	27.983j.mol-1.k-1

Physical properties of Parada

- Lustre: Metallic
- Transparency: Opaque
- Colour: Tin white
- Streak: Could not be powdered
- Hardness Data: Could not be measured
- Fracture: None observed
- Density: 13.596 g/cm^3 (Measured)

Sources

In the classics the following references are available.

पश्चिमे तु रसेन्द्रं हि पूजयेत् सिद्धिपूर्वकम- Rasa sara

पश्चिमायां विमुक्तं यत् सूतोऽभूत् सर्वकार्यकृत्- Rasa Sanket Kalika

In both above references western direction is indicated.

पतितो दरदे देशे गौरवाद् बह्निवक्त्रतः- R.R.S. 1/89

Dr. P.C. Ray has accepted that Darada Desh is located at the border of Kashmira.

The various synonyms of Hingula indicate the different place which may denotes that it is found in these regions.

हिंगुले हिंगलुम्लेच्छ हिंगुलेङ्गुल-हिङ्गलम ।
चर्मारवर्दनं चूर्ण-पारदो दराह्वयम् ॥
कुरुविन्दं चीनपिष्टं लघुकन्दरसं पुनः ।
चर्मारगंधिका रत्नरागकारि च हंसकम् ॥

(Ras.Kam. 3/357-58)

The words Malechchha, Chinapishta are indicative of Yavana (Greek) and China respectively. It was come in the bag of leather so named as Charmargandhika.

महागिरिषु चाल्पीयः पाषाणान्तःस्थितो रसः ।
शुष्कशोणः स निर्दिष्टो गिरिसिन्दूरसंज्ञया ॥

(R.R.S. 3/137)

In the above context Girisindoor, an compound of Parada, is said to be found at lower altitude of big mountains.

Modern view of Mercury occurrence

The abundance of Mercury in the earth's crust has been reported at 0.08 ppm. In the nature it can exist as-

a) Metal b) Inorganic compound

c) Organic compound

The most prevalent mineral of Mercury is Cinnabar whose chemical formula is HgS. It is found in highest concentration in volcanically active zones such as the circumpacific volcanic belt, the east pacific rise and the Mid-Atlantic Ridge (Ehrilch.

H.L; Newman D.K. (2008) ISBN 978-0-8493-7906-2 Geo microbiology CRC Press p 265).

Mercury is found either as a native metal, which is rare, on in Cinnabar, Meta cinnabar, Corderoite, Livingstonite and other mineral with cinnarbar (HgS) being the most common. Mercury is most commonly produced in Spain particularly from Almaden mine which is known for its high-quality mercury. It may also be obtained from United States (Mainly California), Yugoslavia and Italy. The Mt. Amiata mining district (Southern Tuscarry Italy) is a world class district with a cumulate production of more than 100,000 tonnes of mercury between 1870-1980. Besides these countries like Peru, Mexico, China, Australia, France, Hungery etc. are also mercury producing country.

The chief ores of Mercury are as follows:

1. Colomel - [Hg2]2+ Cl2 (Hg2 Cl2)
2. Cinnabar HgS
3. Meta cinnabar - HgS
4. Eglestonite - (Hg2)2+3 OCl3 (OH)
5. Terlinguaite - (Hg2)2+Hg22+ Cl2O2
6. Lovingstonite - HgSb4+S8 (It is a mercury antimony Sulfosalt mineral and is black in colour)

Types

According to Kshetra (Kupa) Bheda the Parada is of five types which is as follows:

रसो रसेन्द्रः सूतश्च पारदो मिश्रकस्तथा।
इचि पञ्चविधो जातः क्षेत्र भेदेन शम्भुजः॥
(R.R.S. 1/68)

1. Rasa 2. Rasendra
3. Suta 4. Parada 5. Mishraka

The character and colour of these can be summarised as-

Type	Colour	Quality
Rasa	Rakta Varna	Free from Sarva Dosha and having Rasayana Guna
Rasendra	Shyava	Free from Dosha and having Rasayana property
Sutaka	Eshat Pita	Contains Dosha but after Samskar provides Deha and Loha Siddhi
Parada	Shweta	Sarva Rogahara
Mishraka	Mayurac-handrika	Provides Siddhi after potentiated with eighteen Chhayavat Samskara.

Grahya and Agrahyata of Parada

Grahya Lakshna (acceptable quality) of Parada

अन्तः सुनीलो बहिरुज्जवलो यो मध्याह्नसूर्यप्रतिमप्रकाशः।
योज्योऽथ.....॥ (A.P. 1/139)

The Parada which is Antah Sunila (Bluish from inside), Bahirujjwalah (Whitish from outside), Madhyahana Surya Pratim Prakash (When pure shines like mid-day sun) is selected for use in various process. These are the physical qualities of pure Parada.

Agrahya Lakshana of Parada

धूम्रःपरिपाण्डुरश्च चित्रो न योज्यो रसकर्म सिद्धयै ॥
(A.P. 1/139)

The Parada which looks Dhumra (Smoky), Pari Pandura (Complete yellowish) and Chitra (Having shades of various colour) should not be taken for Rasa Karma.

Doshas

The physical, chemical or other types of unwanted effects of Parada are termed as Parada Dosha. The classical reason for Parada Dosha is as follows:

एवंभूतस्य सूतस्य मर्त्यमृत्युगदच्छिदः।
प्रभावान्मानुषा जाता देवतुल्यबलायुषः॥
तान्दृष्ट्वाऽभ्यर्थितो रुद्रः शक्रेण तदनन्तरम्।
दौषैश्च कञ्चुकाभिश्च रसराजो नियोजितः॥
तदाप्रभृति सूतोऽसौ नैव सिध्यत्यसंस्कृतः॥
(R.R.S. 1/80-82)

Due to having quality of Jara, Mrituya and Roga Nashaka human beings also became equal to Deva in Bala and Ayush. Seeing this phenomenon Devraj Indra Pray to God Rudra after that Rudra accompanied the Parada with Sapta Kanchuka dosha. Since then, without doing Samskaras Parada is not capable of provide Siddhi.

Note- Mercury is obtained from earth. The impurities from where it is obtained are mixed with

it. These impurities may be in the form of metal, charcoal etc.

The Doshas of Parada are categorised as follows:

1. Naisargika Dosha
2. Yougika Dosha
3. Aupadhika Dosha

1. Naisargika Dosha- This type of Doshas came from nature or natural sources. As per most of the classics these are three in numbers but five, nine and fifteen types are also found mentioned in the texts. The three types are as follows:

विषं बह्निर्मलश्चेति दोषा नैसर्गिकास्त्रयः।
(R.R.S. 11/17)

i.e. Visha, Vahin and Mala are three Naisargika Doshas. These have specific untoward effect if these are present along with Parada.

रसे मरणसन्तापममूर्च्छानां हेतवः क्रमात्॥
(R.R.S. 11/17)

Visha, Vahni and Mala Dosha causes Marana, Santapa and Murchchha respectively.

The other Naisargika Dosas are tabulated as below-

Sr. No.	Name of the text	Name of Dosha
1.	Rasen. Mangala	1. Mala 4. Gurutva 2. Visha 5. Capalatva 3. Vahni
2.	Rasa Prakash Sudhakar	1. Mala 4. Mala 2. Visha 5. Darpa 3. Vahni
3.	Rasa Kamdhenu	1. Visha 4. Gurutva 2. Vahni 5. Uddinatva 3. Mala 6. Kautilya 7. Anaavarta 8. Sankara 9. Shandatva
4.	Anand Kanda Amrit Vishranti	1. Parthiva 2. Jala 3. Agneya 4. Vayu 5. Nabhasa 6. Gajacharma 7. Pandarika 8. Visharpkrita 9. Haridra 10. Rakta charma 11. Naranga 12. Raktabinduka 13. Asahyagni 14. Mala

2. Yaugika Dosha- These are mixed in Parada from outside the mines by the traders for commercial point. After mixing these the weight of Parada is increased. Naga and Vanga are commonly used for this purpose and these are known as Yaugika Dosha.

यौगिको नागवङ्गौ द्वौ तौ जाड्याध्मान कुष्ठदौ॥
(R.R.S. 11/18)

Naga and Vanga these two are Yaugika Dosha and cause Jadya Adhmana (Flatulence with gurgling sound) and Kustha (Diseases of skin).

3. Aupadhika Dosha- This is also known as Kanchuka Dosha. These Doshas come in Parada either from Bhumi (Earth), Jala (Water) or from the metallic ores that are found associated with in the mines. As Parada has greater specific gravity so these Doshas come on the surface and makes covering over it so termed as Kanchuka, Rasa Tarangini has explained it in following way.

धातवो रस संश्लेष्टा यदा विष्णुपदामृतम्।
गृह्णन्ति हि तदा तेषां कश्चिद् भागोऽवशीर्यते॥
ततश्चूर्णत्वमापन्ना रसमाच्छादयन्ति ते।
तेनावरणसाम्येन धातवः सूतसंगताः॥
कञ्चुकाख्यां भजन्तीति प्राच्यपाश्चात्त्यसम्मतिः।
केचिदेते कञ्चुकाख्या दोषा औपाधिकाः स्मृताः॥
(R.T. 5/11-13)

When metals like Tin or Lead mixed in Parada, reacts with oxygen and get oxidise and their oxidised part in powder form covers the Parada on to its outer surface.

Because it is in covering form so the scholars of ancient and modern time termed it as Kanchuka. Some of the scholars termed it as Aupadhika Dosha. These are seven in numbers.

औपाधिकाः पुनश्चान्ये कीर्तिताः सप्त कञ्चुकाः।
भूमिजा गिरिजा वार्जा द्वे च द्वे नागवङ्गजे॥
(R.R.S. 11/19)

These are Bhumija, Girija, Varija and two-two from each Naga and Vanga.

Name of Sapta Kanchuka Dosha

पर्पटी पाटनी भेदी द्रावी मलकरी तथा।
अन्धकारी तथा ध्वाङ्क्षी विज्ञेयाः सप्त कञ्चुकाः॥
(R.R.S. 11/21)

Parpati, Paatani, Bhedi, Dravi, Malkari,

Andhakari and Dhvankshi are seven Kanchuka Doshas. These come in following manner-

Bhumija	Girija	Varija	Naga		Vanga	
↓	↓	↓	↓	↓	↓	↓
Parpati	Paatani	Bhedi	Dravi	Malakari	Andhakari	Dhavankshi

Effect of Kanchuka Dosha- When Kanchuka Doshas are present in Parada and it is consumed then it produced the following disease.

भूमिजाः कुर्वते कुष्ठं गिरिजा जाड्यमेव च।
वारिजा वातसङ्घातं दोषाढ्यं नागवङ्गयोः॥
(R.R.S. 11/21)

Bhumija cause Kushtha, Girija cause Jadyata, Varija cause Vata disease while Naga and Vanga vitiate the Doshas.

Note- Parpati - Sharira Shosha
Patni - Vidarakatva
Bhedi - Mala Bheda
Dravi - Dhatu Drava
Malakari - Vitiation of Dosha
Andhakari - Andhata
Dhvankshi - Hoarshness of voice (Karkash Svara)

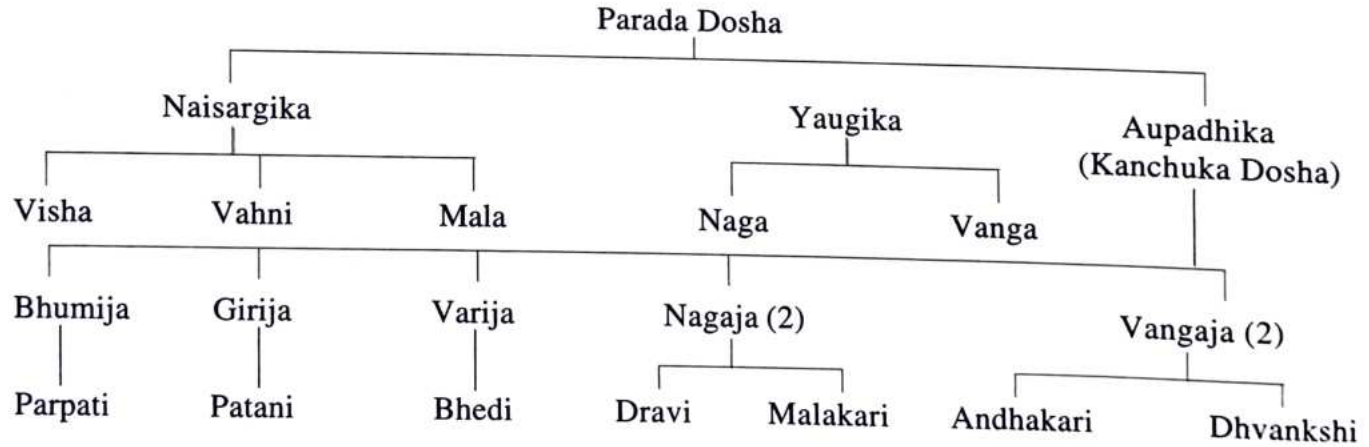
Parada Dosha according to Ayurveda Prakasha

नागो वङ्गो मलो बह्निश्चापल्यं च विषं गिरिः।
असह्याग्निर्महादोषा निसर्गात्पारदे स्थिताः॥
(A.P. 1/10)

Naga, Vanga, Mala, Vahini, Chaplya, Visha, Giri and Asahyaagni, these eight are Maha Dosha that are present in Parada naturally. However Ayurved Prakash has also counted twelve Doshas as follows :

द्वादशैते रसे दोषाः प्रोक्ता रसविशारदैः।
(A.P. 1/11)

These twelve Doshas can be illustrated as follows :



Shodhana

रसेश्वरं समसुधारजसा मर्दयेत् त्र्यहम्।
ततो द्विगुणवस्त्रान्तर्गालितं खल्वकेन्यसेत्॥
रसोन निष्तुषं तुल्यं तदर्धं लवण हरेत्।
तल्कल्के मर्दयेत्सूतं यावदायन्ति कृष्णताम्॥
कृष्णं कल्कं परित्यज्य तथा प्रक्षाल्य युक्तितः।
एवमेकेन वारेण रसेन्द्रः शुद्धिमाप्नुयात्॥
(R.T. 5/27-30)

1. First Parada is mixed with lime powder and triturated for three days, filtered. Then it is mixed with equal quantity of dehsuked garlic and half part of Saindhava and triturated till the bolus turns to black colour. Then it is washed with hot water and collected. In this manner, Parada gets purified by doing it only one time.
2. Parada is triturated with Kumari Swarasa,

Chitraka moola, Raktasarshapa, Brihati and Triphala Kashaya for three days. Then it is washed and collected.

3. Parada is triturated with Tambula Patra Swarasa, Adraka Swarasa, Yavakshara, Swarjika Kshara and Tankana Kshara for three days, washed. Thus, it gets purified.

Note- In the above method when Parada is triturated in the last it is divided into very fine globules which floats on the surface of water. So proper precaution should be taken to avoid loss. It is also known as Jala Gali of Parada.

Ingredients	Procedure	Reference
Parada, Gritakumari, Chitraka Kwatha, Rakta Sarshapa, Brihati Kwatha, Triphala Kwatha	Mardana with the prescribed drugs for three days.	R.T.5/31, RM. 1/ 21 R.J.N.4
Parada, Nagavallidala Rasa, Adraka, Rasa, Ksharatraya	Mardana with the prescribed drugs for three days.	R.T.5/34-35
Parada, Sudha, Grihadhooma, Ishtika, Kanji	Parada Mardana with Sudhachurna for 7 days and then Mardana with Grihadhooma and Ishtika for 3 days and washed with Kanji and separated using fourfold cloth.	R.T.5/36-37
Parada, Shweta Chandana, Devadaru, Kaakajangha, Jayanti, Karkati, Musali, Kanya	Parada Mardana is done with the Rasa of the mentioned Dravyas and then subjected to Patana.	R.S.S.1/27 A.K.23/22 R.J.N.4
Parada, Kumari, Nisha Churna	Parada Mardana is done with the mentioned Dravyas and then Patina is done in Patina Yantra.	R.S.S.1/28, R.J.N.4, A.K.23/ 23-24
Parada, Jayanti Patra, Eranda Patra, Adraka Rasa, Vayasa	Parada Mardana is done with the mentioned Dravyas.	R.S.S.1/30
Parada, Nisa, Ishtika, Grihadhooma, Amlapishti, Urna, Triphala, Aranala, Kanya	Parada Mardana is done with the mentioned Dravyas. It is Saptakanchuka Nashana.	R.S.S.1/33 R.J.N.4
Parada, Kumari Swarasa, Chitraka Kwatha, Kakamaachi Rasa	Parada Mardana with Kumari Swarasa for 1 day, Chitraka Kwatha for 1 day and with Kakamaachi Rasa for 1/2 day	R.S.S.1/34 R.J.N.4
Parada, Rasona Swarasa, Nagavallidala Rasa, Chitraka Kwatha, Kanji	Parada Mardana is done with each of the Swarasa and then separated by Kshaalana with Kanji. It becomes Sarvadosha Nirmukta and can be used in Sarvakarma.	R.S.S.1/35-36 R.J.N.4

Rasa Tarangini has described removal of specific Dosha by using specific Dravya which is as follows :

धूमेष्टिकाहट्टविलासिनीनां सोर्णैस्तु चूर्णैः परिमर्द्य सूतम् ।
प्रक्षालयेदम्लजलेन सम्यक् ततो रसो मुञ्चति नागदोषम् ॥
मृगक्षणाङ्कोलनिशोत्थचूर्णैः सूतो जहातीह तु वङ्गदोषम् ।
चित्रोऽग्निदोषं विनिहन्ति शीघ्रं दोषं मलोत्थं खलु राजवृक्षः ॥
चापल्यहारी खलु कृष्णधूर्तो विषापहर्त्री त्रिफला प्रशस्ता ।
दोषं गिरेस्त्र्यूषमाशुहन्यात् त्रिकण्टको बह्वयसहत्वदोषम् ॥
चूर्णं कलांशप्रमितं तु सूतात् सकन्यकं भाषित भेषजानाम् ।
विमर्दयेत्खल्वगतं दिनैकं प्रक्षालयेच्चापि ततोऽम्लतोयैः ॥
रीत्यानया शोधित ईशसंज्ञः सत्यं भवेत्कञ्चुकदोषहीनः ।
इत्थं विशुद्धं खलु सूतराजं नियोजयेद्वैद्यवरो रसेषु ॥
(R.T. 5/22-26)

The above detail is summarised as follows :

Sr. No.	Dosha	Material used	Amount	Liquid for washing	Method	Result
1.	Naga	Grihadhoma Ishtika churna Haridra+wool	Each 1/16 to quantity of Parada	Acidic Kanji	Mardana with Aloe juice	Removal of Naga Dosha
2.	Vanga	Indrayava Ankola, Haridra	,,	,,	,,	Vanga Dosha
3.	Agni	Chitraka	,,	,,	,,	Agni Dosha Nasha
4.	Mala	Aagvadha	,,	,,	,,	Removal of Mala Dosha
5.	Chapalata	Krishna Dhatura	,,	,,	,,	Free from Chanchalya
6.	Visha	Triphala	,,	,,	,,	Free from Visha Dosha
7.	Giri	Trikatu	,,	,,	,,	Giri Dosha Nasha
8.	Ashayagni	Trikantaka (Gokshura)	,,	,,	,,	Free from Ashayangi

Marana of Parada

Ingredients	Method	Reference
Shudda Parada 1part Palasha Beeja 1 part, Raktajambeeramla	Mardana is done along with Sajeeva and then Yantra Pachana	R.R.S. 11/113
Shudda Parada, Apamarga Beejaanvita Churna Pushkara Beeja Churna	Made into a Kalka and placed in Dhrida moosharava and Puta Given	R.R.S. 11/114
Shudda Parada Hingu + Kakodumbarika Ksheera	Hingu is given Bhavana with Kakodumbarika Ksheera and Mardana is done with Parada and Puta given	R.R.S. 11/115
Shudda Parada, Devadaali + Harikranta + Aranala	Devadaali and Harikranta are given Bhavana with aranala and its rasa is used for mardana and moorchana of parade and then placed in kharpara and kept over chullika and pachana is done by adding the rasa frequently and stirring to obtain Lavana like bhasma. (Shweta roopa)	R.R.S.11/1,16-117 R.T. 7/17-19 A.K.Am. 23/63-64,
Shudda Parada, Apamarga Beeja Churna, Eranda Churna	Mardana is done together and placed in moosha containing the churnas above and below. Then sandhibanda is done and Laghuputa is given for 4 times	R.R.S. 11/118
Shudda Parada, Naaripaya, Katutumbiphala	Parada is placed inside Katutumbiphala and dipped in Naariksheera and swedana is done using vanopala.	R.R.S.11/1 19 R.J.N.4
Shudda Parada, Shudda Gandhaka, Ankolamoola rasa	Bhavana of Ankola moolarasa is given to Parada and Gandhaka (kajjali) for one day and puta is given in bhudarayantra for 1 day.	R.R.S.11/120, R.J.N.4, R.T. 7/20-22, A.K.Am.23/72-73

Probable physicochemical changes

Physical property of Parada before and after Shodhana.

Property	Ashodhita Parada	Shuddha Parada
Colour	Silverish white	Bright silver
Odour	Odourless	Odourless
Touch	Soft	Soft
Lustre	Present	Increases after Shodhana

Sample	As	Cd	Pb	Hg
Ashodhita Parada	Not detected	Not detected	Not detected	99.97%
Shuddha Parada	0.026%	0.0021%	Not detected	99.93%
Permissible limit (in ppm)	3	0.3	10	-

In their study Sunil Kumar Signh et al. found that Kajjali shows peaks due to free sulphur, mercury oxide and mercury sulphide in the XRD analysis while peaks only due to mercury sulphide were seen in the XRD analysis of Rase Sindoor. This shows that effect of temperature and process of medicine that free Sulphur and mercury oxide were not present after processing.

Importance of Temperature while processing

It has been proved by the texts of Rasashastra and modern science that mercury is non-flammable in fire. Mercury continues to vaporize even at room temperature. Therefore, before placing the mercury on the fire, it is made permanent on the fire. Sulfur is mainly used for this. Like, Rasaparpati, Kajjali or Rasa Sindoor. Because all three are made at different temperatures, i.e. Kajjali is made at room temperature, Rasaparpati is made at 118-120ãC and Rasa Sindoor is made at 250-450^{0}C. Therefore, while manufacturing them or while making various medicines of mercury, suitable fire is provided so that they can be manufactured.

Yoga- Rasa Parpati, Kajjali, Rasa Sindura, Aarogyavardhini Vati, Rasa Karpoora

Research updates

- Safety evaluation of Siddha Makardhwaja done by Gajendra Kumar et al. show that Sidh Makardhwaja up to five times the equivalent human dose administered for 28 days did not show any toxicological effects on rat brain cerebrum, liver and kidney.
- Kumar G. Srivastava A, Sharma SK, Gupta YK. Safety evaluation of mercury based Ayurvedic formulation (Siddha Makardhwaja) on brain cerebrum, liver & kidney in rats. Indian J Med Res. 2014 Apr; 139 (4):610-8, PMID:24927349; PMCD:PMC 4078501.
- Safety studies on Arogya Vardhini under the aegis of Deptt. of Pharmacology, AIIMS. Delhi shows that Arogya Vardhini Vati in the doses equivalent up to times of the human dose administered to rats for 28 days does not have appreciable toxicological effect on brain, liver and kidney due to mercury. Study was conducted by Department of Ayush under Union Ministry of Health & Family welfare, Government of India.

Abhraka (Biotite Mica)

Abhraka is mentioned as the first substance in the classification of Maharasa according to Rasaratna Samucchaya. It is widely used for Anti-Ageing purpose. This mineral is freely aviaible in parts of state Karnataka, Rajasthan, Tamila Nadu and Bihar.

Synonyms

अभ्रकं गगनं भृङ्गमभ्रं खं व्योमनामकम्।
वज्रं घनञ्च गिरिजं बहुपत्रमनन्तकम्॥
आकाशमम्बरं शुभ्रं त्वमलं गरजध्वजम्।
मेघाख्यमन्तरिक्षञ्च तदेव परिकीर्तितम॥
(R.T. 10/1-2)

Abhraka, Gagan, Bhring, Kha, Vyoma, Vajra, Ghana, Girij, Bahupatra, Anantakam, Aakash, Ambar, Shubhra, Amala, Garaj Dwaja and all the name of cloud, Antrikshya, Gauriteja are the synonym of Abhraka.

Mineralogical Identification

Nature	-	Platy (Separable in thin layers)
Colour	-	Greenish black
Streak	-	Greenish black
Cleavage	-	Perfect
Lusture	-	Splendent
Tensity	-	Flexible
Transparency	-	Translucent
Hardness	-	2.5 to 3
Specific gravity	-	2.6 to 3

Sources

Abhraka occurs in igneous rocks in pure form as well as in metamorphic rocks as schists and gneisses.

It occurs in ore form in pegmatites but pure mineral in sheet form can be made available through sorting in pegmatite bodies. It is found mostly in the mica belts of Rajasthan, Andhra Pradesh and Jharkhand. The main deposits in these states occurs at Ajmer, Bhilwara, Tonk and Pali in Rajasthan. Kalichedu, Thalpur and Gudur in Andhra Pradesh, Koderma and Giridih in Jharkhand. Other known occurrences are in the states of Tamil Nadu, Karanataka, Kerala and West Bengal.

राजहस्तादधस्ताद् यत्समानीतं घनं खनेः।
भवेत् तदुक्तफलदं निःसत्त्वं निष्फलं परम्॥
(R.R.S 2/3)

According to Rasa Classics from where Abhraka is obtained it should be collected below the depth of Raja Hastra.

Types

According to Modern- Mica is group of Hydrous Potassium Aluminium Silicate minerals which is available in different form. It's main types with chemical formula are as follow :

Biotite	K(Mg Fe2+)3 (Al Fe3+) Si3 O10 (OH F)2	Black colour
Phlogopite	KMg3Si3 Al O10 (F OH)2	Brown colour
Lepidolite	K (Li Al)3 (Si Al)4 O10 (F OH)2	Pink colour
Muscovite	K Al2 (SiAl) O10 (OH F)2	White colour
Paragonite	Na Al2 (Si3Al) O10 (OH)2	White colour
Glauconite	(K Na) (Fe3+ Al Mg)2 (Si Al)4 O10 (OH)2	Green colour

According to Rasa Classics- In the classics of Rasa Shastra Abhraka is of four types viz Pinaak, Naga, Mandook and Vajra. Further all of the four varieties are of four types depending upon colour i.e. Shweta, Rakta, Pita and Krishna. So total types are sixteen of these sixteen types Krishna Vajra Abhraka is superior to all and it is used for Rasakarma and Chikitsa karma. The detail is as follows:

1. Pinaak

पिनाकं पावकोत्तप्तं विमुञ्चति दलोच्चयम्।
तत्सेवितं मलं बद्ध्वा मारयत्येव मानवम्॥
(R.R.S. 2/5)

This type of Abhraka when heated its layer separate from each other. When it is ingested, it causes death due to Malabaddhata.

2. Naga

नागाभ्रं नागवत्कुर्याद्ध्वनिं पावकसंस्थितम्।
तद्धुक्तं कुरुते कुष्ठं मण्डलाख्यं न संशयः॥
(R.R.S. 2/6)

Naga variety on heating produces hissing sound

like Naga (Snake). It causes Mandal Kushtha when ingested.

3. Mandooka

उत्प्लुत्योत्प्लुत्य मण्डूकं ध्मातं पतति चाभ्रकम्।
तत्कुर्यादश्मरीरोगमसाध्यं शस्त्रतोऽन्यथा॥
(R.R.S. 2/7)

This variety of Abhraka breaks on heating into pieces which jumps like frog. On ingesting it causes Ashmari which is only curable by surgery.

4. Vajra

वज्राभ्रं बह्निसन्तप्तं निर्मुक्ताशेषवैकृतम्।
देहलोहकरं तच्च सर्वरोगहरं परम्॥
(R.R.S. 2/8)

On heating it remains unchanged. It provides Deha and Loha Siddhi as well as mitigates all the diseases.

Note- The Micas are silicates of varying composition of Aluminium and Potassium containing hydroxl, Magnesium, Iron, Sodium, Lithium and Flourine. The silica content varies between 33-55%. All the micas yield water content when heated in a closed tube. When Abhraka is heated then this water comes out giving specific characters which is describing in the texts of Rasa Shastra.

Grahya Lakshana of Abhraka

स्निग्धं पृथुदलं वर्णसंयुक्तं भारतोऽधिकम्।
सुखनिर्मोच्यपत्रं च तदभ्रं शस्तमीरितम्॥
(R.R. S. 2/11)

The Abhraka which his smooth, having thick layers, good colour and heavy in weight, of which layers can be separated easily is accepted for various purpose.

Shodhana of Abhraka

प्रतप्तं सप्तवाराणि निक्षिप्तं काञ्जिकेऽभ्रकम्।
निर्दोषं जायते नूनं प्रक्षिप्तं वाऽपि गोजले॥
त्रिफलाक्वथिते चापि गवां दुग्धे विशेषतः॥
(R.R. S. 2/16)

Abhraka is heated till it becomes red hot now it is quenched into Kanji. By repeating this process for seven times Abhraka is free from Doshas. For quenching Gomutra, Triphala Kwatha and cow milk can be used.

अभ्रकं दहनोत्तप्तं सप्तवारं निषेचितम्।
बदरीक्वथिते पश्चात् पेषितं शुद्धिमाप्नुयात्॥
(R.T. 10/21)

After being red hot when Abhraka is dipped into Badri Kwatha and process is repeated for seven times followed by grinding Abhraka becomes pure.

Dhanyabhraka

The term Dhanyabhraka denotes the state of Abhraka after its processing with Dhanya. The method for this is as follows :

पादांश शालिसंयुक्तमभ्रकं कम्बलोदरे।
त्रिरात्रं स्थापयेन्नीरे तत् क्लिन्नं मर्दयेत् दृढम्॥
कम्बलाद्गालितं श्लक्ष्णं बालुकारहितञ्च यत्।
तद्धान्याभ्रमिति प्रोक्तमभ्रमारण सिद्धये॥
(R.R.S. 2/154)

चूर्णाभ्रं शालिसंयुक्तं वस्त्रबद्धं हि काञ्जिके।
निर्यातं मर्दनाद्वस्त्राद्धान्याभ्रमिति कथ्यते॥
(R.R.S. 2/21)

Abhraka and 1/4 part (to that of Abhraka) Shali Dhanya are kept into Pottali made with piece of blanket. This Pottali is kept into water/Kanji for three days after that it is rubbed forcely. After doing so very fine particles of Abhraka comes out through pores of blanket which is devoid of sand and having smoothness. This is known as Dhanyabhraka and is useful for Marana.

Marana of Abhraka

धान्याभ्रं कासमर्दस्य रसेन परिमर्दितम्।
पुटितं दशवारेण म्रियते नात्र संशयः॥
(R.R.S. 2/22)

Dhanyabhraka is levigated with Swarasa of Kasamarda and pellets are made and Puta is given. This process is repeated for ten times by doing so the Abhraka Bhasma is made definitely.

गन्धर्व पत्र तोयेन गुडेन सह भावितम्।
अधोर्ध्व वटपत्राणि निश्चन्द्रं त्रिपुटैः खगम्॥
(R.R.S. 2/26)

Dhanya Abhraka is mixed with equal quantity of Jaggery and is levigated with Erand Patra Swarasa and pellets are made. These pellets are kept between Vata Patra (Ficus bengalensis leaf) and Puta is given. Giving three Puta following same process Nishchandra Abhraka Bhasma is prepared.

धान्याभ्रकं समादाय रविक्षीरैर्विमर्दयेत् ।
रविमूलद्रवैर्वापि दिनमेकं निरन्तरम् ॥
ततः संशोषयेदधर्मे गगनं कृत चक्रिकम् ।
रविपत्रैश्च संवेष्ट्य सप्तवारं विधानतः ॥
पुटेद्गजपुटे नैव रसतन्त्र विशारदः ।
ततो न्यग्रोधमूलोत्थोः क्वाथैर्दद्यात्पुटत्रयम् ॥
तद्वद्रम्भारसेनापि सप्तवारं पुटेद्भिषक् ।
एवं स्वल्पैः पुटैरेव गगनं मृतिमाप्नुयात् ॥
(R.T. 10/39-42)

The Dhanyabhraka is ground well with Arka Ksheera or Arka Mula Rasa or Arka Patra Sharava for one day and Chakrikas are made and dried. These Chakrikas are kept in a Sharava Samputa and Sandhi Lepa is done. Then Gaja Puta is given. This process is repeated for seven times. Then Abhraka is ground well and Bhavita with Vata Mula Svarasa and puta is given for three times. Again the Abhraka is ground with Kadali Rasa and seven Gaja Putas are given separately. By doing so the Abhraka Bhasma is prepared.

Other processing techniques

Lohitikarana

When Abhraka Bhasma is prepared but does not have red colour then by the process of Lohitikarana red colour is generated. It is as follows :

अथ नागबलाभद्रमुस्ताक्वाथैर्वटस्य च ।
दुग्धैर्वटजटातोयैर्हरिद्रावारिणाऽपि च ॥
मञ्जिष्ठाक्वाथतोयेन सर्वैरेभिर्यथाक्रमम् ।
पुटितं भावनायोगाच्चरमे पुटने मुहुः ॥
जायते ह्यरूणं चाति भस्म वज्राभ्रकोद्भवम् ।
(A.P. 2/133-34)

Prepared Abhraka Bhasma is levigated with Nagbala, Bhadra Musta, Vata Ksheera, Vata Jata Kwatha, Haridra Kwatha and Manjistha and Puta is given. By doing this Abhraka Bhasma becomes red in colour.

Amritikarana

If any dosha left in Abhraka Bhasma after preparing it then the process which is done to remove Doshas is known as Amritikarana. It is done in following manner.

तुल्यं घृतं मृताभ्रेण लोहपात्रे विपाचयेत् ।
घृत जीर्णे ततश्चूर्णे सर्वकार्येषु योजयेत् ॥
(A.P. 2/139)

Equal parts of Abhraka Bhasma and Ghrita is Pachita by putting it into a Lauha vessel on heat. When only Abhraka Bhasma remains then it is used in every purpose.

Abhraka Satva Patan

पादांशटङ्कणोपेतं मुसलीरसमर्दितम् ।
रून्ध्यात्कोष्ठ्यां दृढं ध्मातं सत्त्वरूपं भवेद् घनम् ॥
(R.R.S. 2/28)

Abhraka and 1/4th part of Tankana is levigated with Swarasa of Musli then it is made into small ball size and kept into Musha and strong heat is given by means of Koshthi. After doing this process Satva of Abhraka is obtained. The Satva obtained in the process is in the form of small Ravaka. These Ravaka are collected carefully and melted to obtained big size.

Abhraka Druti

अगस्त्यपत्रनिर्यासैर्मर्दितं धान्याकाभ्रकम् ।
सूरणोदरमध्ये तु निक्षिप्तं लेपितं मृदा ॥
गोष्ठभूमौखनित्वा तु हस्तमात्रे हि पूरितम् ।
मासान्निष्काशितं तत्तु जायते पारदोपमम् ॥
(A.P. 2/156-57)

Dhanyabhraka is being levigated with juice of Agstya Patra then it is kept inside the mid of Surankanda then closed by applying soil. A pit having depth of one Hasta is digged in Goshala and it is kept in this pit for one month. After one month it is taken out and Abhraka Druti resembling to Parada is obtained.

Probable Physico-chemical Changes

In their study K. Shailesh et al. have synthesized Abhraka Bhasma by two traditional methods and were analyzed during each phase of preparation i.e. Shodhan, Dhanyabhraka, Marana and Amritikarana the following mean crystalline size/ nm were found by XRD-

After stage	Crystalline size/nm	
	Method-1	Method-2
1. Shodhana	114	119
2. Dhanyabhraka	47	106
3. Marana	62	54
4. Amritikarana	85	80

Method I- Shodhana in Go-Dugdha for seven times (Nirvapa)

Method II- Shodhana in Cow urine for seven times (Nirvapa)

The above observation shows that the crystalline size goes on decreasing with the process such as Shodhana, Dhanyabhraka and Marana.

S. Kantak et al/Journal of Ayurveda and Integrative medicine 11(2020) 236-242.

Importance of Temperature

The process of Shodhana, Marana and Satvapatana of Abhraka required high temp. When Abhraka is heated to about 1000 Celsius in the outer zone temp of the burner flame, it almost doubles its volume. A temp of 1500 to 1800 Celsius is required for the formation of Satva Patana, while the Bhasma formation is done by Mahaputa 1200 Celsius is required.

Abhraka Bhasma Yoga

1. Arogyavardhini Vati
2. Nagarjunabhra Rasa
3. Panchamrita Parpati
4. Gagan Parpati
5. Vasant Kusumakar Rasa
6. Shwasa Kasa Chintamani Rasa
7. Nardiya Lakshamivilas Rasa
8. Yogendra Rasa

Research updates

EDX spectrum of Abhraka bhasma shows presence of elements Si, Al, Mg, Fe, K, Na, Ca at major level and also traces of Mn, Cr, Li, Ti, Ba, Rb, Cs at minor levels.

XRD pattern exhibit major crystalline peaks pertaining to Mica and matches well with monoclinic KMg3(Si3Al)O10(OH2). Highly crystalline nature of Bhasma is shown in XRD. Nano sized particle size distribution in seen in DLS curve1.

4. Makshika (Chalco-pyrite)

Makshika is the 3rd Maharasa by Rasaratna Samuchchaya.

Synonyms

सुवर्णमाक्षिकं स्वर्णमाक्षिकं हेममाक्षिकम्।
माक्षीकं माक्षिकञ्चैव ताप्यञ्च धातुमाक्षिकम्॥
माक्षीकधातुञ्च तथा तापीञ्चापि तन्मतम्॥
(R.T. 21/1-2)

Suvarn Makshika, Svarna Makshika, Hema Makshika, Maksheeka, Makshika, Tapya, Dhatu Makshika, Tapija are Synonyms of Makshika

Mineralogical Identification

Nature	- Massive, Smooth
Colour	- Golden yellow
Streak	- Greenish black
Fracture	- Uneven
Lustre	- Metallic
Tenacity	- Brittle

Transparency	- Opaque
Hardness	- 3 to 4
Specific Gravity	- 3.4 to 3.7

Sources

Svarna Makshika in ore form, occurs mainly in metamorphic rocks of pre-Cambrian age. Occurrence of 100% pure Svarna Makshika in abundance is not common because it is always associated with host rock in the form of disseminations, streaks, stringers, patches, veins or lodes as fracture and cleavage fillings.

In India, large deposits of Svarna Makshika occurs mainly in Khetri, Distt Jhunjhunu in Rajasthan. Malanjkhand Disst. Balaghat. M.P. and Ghatsheela, Dist. Singhbhum in Jharkhand. Small deposits occur, Chitradurga and Hassan in Karnataka, Kurnool and Guntur in Andhra Pradesh and Rangpo in Sikkim.

According to Rasa Grantha

सुवर्णशैलप्रभवो विष्णुना काञ्चनो रसः।
ताप्यां किरातचीनेषु यवनेषु च निर्मितः॥
ताप्यः सूर्यांशुसन्तप्तो माधवे मासि दृश्यते॥
(R.R.S. 2/77-78)

Svarna like Rasa, originated at Sumeru mountain, is established by God Vishnu on the bank of Tapi river, Kirat Desha, China and Yavana. In the month of Madhav when it is heated by Sunrays then it is visible. Kanyakubja and Tapti bank are also the places where it occurs. Makshika which is found near the bank of Tapi is Panch Varna Suvarnvata. Whereas it is Nava Varna Suvarnvata as per opinion of Acharya Yashodhar Bhat.

Types

Makshika is of two types :

माक्षिको द्विविधो हेमामाक्षिकस्तारमाक्षिकः।
(R.R.S. 2/81)

1. Svarna Makshika (Copper pyrite/ Chalcopyrite, CuFeS2)
2. Rajat Makshika (Iron pyrite, Fe2S3)

Grahya Lakshana

स्निग्धं गुरु श्यामलकांति किञ्चितकषे सुवर्णद्युतिसुप्रकाशम्।
कोणोज्झितं स्वर्ण समान वर्ण सुवर्णमाक्षीकमिह प्रशस्तम्॥
(R.T. 21/4)

Svarna Makshika having qualities like Snigdha, Guru, Shyamal Kanti, Draw golden line on rubbing, on Nikasa, devoid of Kona, having colour of Svarna is superior and acceptable.

Agrahya Lakshana

खरं परं वै गुरूताविहीनं प्रवृत्तकोणं खरलोहकाभम्।
प्रकीर्तितं तत्परिहेयमेव सुवर्णमाक्षीकमिहाययज्ञैः॥
(R.T. 21/5)

Makshika which is rough in touch, light weight, having Kona and lusture of Khara Louha is not accepted for any purpose.

Grahya Rajat Makshika

स्निग्धं सकोणं गुरु च वर्तुल रजतोज्जवलम्।
रौप्यवच्चाकचिक्याढयं जात्यं तद्रौप्यकमाक्षिकम्॥
(R.T. 21/57)

Having characters like Snigdha, Kona, Guru, Vartula (Round) and lustre like Rajat is Grahya for Rajat Makshika.

Agrahya Rajat Makshika

समलं लघु रूक्षञ्च कषेऽतिमलिनच्छवि।
अवर्तुलं विवर्णञ्च हेयं स्याद्रौप्यमाक्षिकम्॥
(R.T. 21/58)

Rajat Makshika which is dirty, light weight. rough, give dirty impression when rubbed on stone. not round, having bad colour is Agrahya.

Shodhana

एरण्डतैललुङ्गाम्बुसिद्धं शुद्ध्यति माक्षिकम्।
सिद्धं वा कन्दलीकन्दतोयेन घटिकाद्वयम्।
तप्तं क्षिप्तं वराक्वाथे शुद्धिमायाति माक्षिकम्।
(R.R.S. 2/83)

1. When Swedana of Svarna Makshika is done in Eranda Taila and Matulung Swarasa with the help of Dola Yantra then it becomes Shuddha.
2. Doing Svedana for two Dhati in Kadlikanda Svarasa it becomes Shuddha.

3. When Makshika heated up to red hot and then quenching in Triphala Kwatha it becomes Shuddha.
4. This process should be done for seven times.

Makshika Marana

मातुलुङ्गाम्बुगन्धाभ्यां पिष्टं मूषोदरे स्थितम्।
पञ्चक्रोडपुटैर्दग्धं म्रियते माक्षिकं खलु॥
(R.R.S. 2/84)

Makshika is grinded with equal part of Gandhaka and Matulunga Swarasa and pellets are made. Then it is kept in Musha and Varaha Puta is given. The Puta process is done for five times for the preparation of Makshika Bhasma.

एरण्डस्नेहगव्याज्यैर्मातुलुङ्गरसेन वा।
खर्परस्थं दृढं पक्वं जायते धातुसन्निभम्॥
एवं मृतं रसे योज्यं रसायनविधावपि॥
(R.R.S. 2/85-86)

Strong heating is done by taking Makshika in an earthen vessel with Erand Taila, Cow's Ghee and Matulunga Svarasa. The process results into Gairika coloured Bhasma of Makshika which is used as Rasayana.

ताप्यं निम्ब्वम्ल संपक्वं पुनर्निम्बूक वारिणा।
सम्पेष्य सम्पुटस्थन्तु पुटयेत कृत चक्रिकम्॥
एवं दशपुटैरेव पञ्चतामेतिमाक्षिकम्।
रक्तोत्पलदलच्छायं जायते चातिशोभनम्॥
(R.T. 21/19-20)

The Shuddha Svarna Makshika is ground well with Nimbu Swarasa in a Khalva Yantra and small thin Chakrikas are prepared and dried. These Chakrikas are placed in Shrava Samputa and subjected to Varaha Puta for 10 times. The prepared Bhasma is of colour having similar to Raktapala (Red colour).

Colour of Bhasma- The colour of Bhasma is similar to Red lotus.

Other processing techniques

Makshika Satva Patana

पादांशटङ्कणोपेतं मर्दितं हेममाक्षिकम्।
ध्मातं मूषागतं सत्त्वं मुञ्चत्याशु सुनिश्चितम्॥
(R.T. 21/46)

Svarna Makshika is ground well with one fourth quantity of Tamkana then it is kept in Musha and strong heating is provided. By doing so the extract (Satva) of Svarna Makshika is obtained definitely.

Probable Physicochemical Changes- The following physico-chemical charges were observed in the Shodhana of Swarna Makshika in Triphala Kwatha.

Parameters Swarna makshika	After Shodhana	Before Shodhana
pH (5% aqueous soln)	4.24	4.52
Loss on drying 1100C (%w/w)	0.67	0.54
Ash value (% w/w)	96.66	91.48

Importance of temperature while processing

For Nirvapa Vidhi in Svarna Makshika purification by Triphala Kwatha. The average temperature required is 829.950C. For the preparation of Bhasma Varahaputa temp. required 8500C and for Satva Patana 14000C.

Yoga

1. Chandra Prabha Vati
2. Jaymangal Rasa
3. Nava Ratna Raj Mrigank Rasa
4. Mritunjaya Rasa
5. Ratnagarbha Pottali

Research updates

Sr. No.	Parameters of Swarna Makshika	Before Shodhana	After Shodhana
1.	Colour	Brassy golden yellow	Blackish
2.	Odor	Odorless	Odorless
3.	Texture	Hard crystallin, Shing	Brittle, course powder
4.	Taste	Metallic	Metallic

XRD studies done on raw Swarna Makshika and Swarna Makshika Bhasma that raw Swarna Makshika contains CuFeS2 while Bhasma

Contains Fe2O3, FeS3, CuS and SiO2. Grains in Bhasma were found uniformly arranged in agglomerates of size 1-2 microns as compound to raw. Swarna Makshika which has grain size of 6-8 microns. in Electron Microscope (SEM) study.

Shilajatu (Asphaltum Punjabianum)

Synonyms

शिलाजतु च शैलेयं शिलाजं शैलधातुजम्।
शिलामयः शिलास्वेदः शिला निर्यास इत्यपि॥

अश्मजं त्वश्मजतुकं गिरिजं त्वद्रिजं तथा।
अश्मोत्थमश्मलाक्षा च गैरेयञ्च मतन्तु तत्॥
(R.T. 26/60-61)

Shilajatu, Shaileya, Shilaja, Shaildhatu, Shilamaya, Shilasveda, Shila Niryas, Ashmaj, Ashmjatuka, Girija, Adrija, Ashmootha, Ashmalaksha and Gaireya are the synonyms of Shilajatu.

Sources

सूर्य सन्तापसन्तप्तः शिलाः शैलाधियस्य यद्।
गाढ़ मुञ्चन्ति निर्यासं तच्छिलाजतु कीर्तितम्॥
शैलाधिपशिलासारो निर्गतो रवितापतः।
शुष्कः सन्मूर्ततां यातः शिलाजतु निगद्यते॥
(R.T. 22/62-63)

When stones of mountain of high altitude are heated by the Sun then exudates come out from these stones. These exudates are known as Shilajatu. Exudates which come out from (Between) stones after being heated by sun. This exudate is dried and solidified then known as Shilajatu.

Types

The different types of Shilajatu are as follows:

Sr. No.	Charaka Samhita	Sushruta Samhita	Rasaratna Samucchaya	Ayurveda Prakasha	Rasa Tarangini
1.	Svarna Adrija	Svarna	Hema Garbha	Svarna	Svarna
2.	Rajat Adrija	Rajat	Raupya Garbha	Rajat	Rajat
3.	Tamra Adrija	Tamra	Tamra Garbha	Tamra	Tamra
4.	Louha Adrija	Krishna Louha	Ayo Garbha	Lauha	Lauha
5.	-	Naga	-	-	-
6.	-	Vanga	-	-	-

The following types are also described in Rasa Texts.

According to Rasa Ratna Samuchchaya

शिलाधातुर्द्विधा प्रोक्तो गोमूत्राद्यो रसायनः।
कर्पूरपूर्वकश्चान्यस्तत्राद्यो द्विविधः पुनः॥
ससत्त्वश्चैव निःसत्त्वस्तयोः पूर्वो गुणाधिकः॥
(R.R.S. 2/109)

1. Go mutra Gandhi — Sa Satva
   (Rasayana property) — Nih Satva
2. Karpura Gandhi

Grahya Lakshana

Shilajatu looking like Laksha and having Mridu Guna should be collected. While Karpoor Shilajatu has Pandu colour and sandy appearance.

पाण्डुरं सिकताकारं कर्पूराभं शिलाजतु।
(A.P. 4/134)

Shodhana

1. क्षाराम्लगोजलैर्धौतं शुद्ध्यत्येव शिलाजतु ॥
शिलाधातुं च दुग्धेन त्रिफलामार्कवद्रवैः।
लोहपात्रे विनिक्षिप्य शोधयेदतियत्नतः ॥
(R.R.S. 2/116-17)

Shilajatu becomes Shodhita when it is washed (Prakshalita) by Kshara, Amla or Gomutra. By dissolving it into Godugdha, Triphala or Bhringraj Svarasa in a Lauha pot it also become Shodihta.

2. क्षाराम्लगुग्गुलोपेतैः स्वेदनीयन्त्रमध्यगैः।
स्वेदितो घटिकामानाच्छिलाधातुर्विशुद्ध्यति ॥
(R.R.S 2/118)

When Swedana of Shilajatu is done for one Ghati time period by means of Svedani Yantra using Kshara, Amla and Guggulu it becomes Shodhita.

3. विगताम्बुदे निवाते धरणीतल प्रदेशे।
प्रखरे निदाद्यकाले प्रणयोच्छिलाजशुद्धिम् ॥
विमलानि भाजनानि त्वयसा विनिर्मितानी।
युगसंमितानि तीव्रे निदधीत सूर्यतापे ॥
सुविचूर्णितं शिलाजं विनिधाय पात्रमध्ये।
द्विगुणं प्रतप्तनीरं त्रिफला कषायमर्द्धम् ॥
गिरिजे प्रदाय यामं निदधीत तीव्रतापे।
अथ तीव्रतापयोगाद्विमलं सरं प्रकाशम् ॥
मृदुलं प्रगाढ़कृष्णं यदुपैति नीरपृष्ठे।
विदधीत सोष्णातो ये खलु भाजनेऽपरस्मित् ॥
अथ वै द्वितीयापात्रात् खलु भाजने तृतीये।
अथ भाजनात्तृतीयात् निदधीत तुर्यपात्रे ॥
सलिलं तु यावदच्छं न भवेत्तु तावदेवम्।
विदधीत वैद्यवर्यः सततं कृतावधानः ॥
सलिलं भवेद्यदाच्छं मलमेत्यधः प्रदेशे।
सलिलोर्ध्व भाग संस्थं गिरिजं हरेद्विशुद्धम् ॥
(R.T. 22/69-77)

1. Ashuddha Shilajatu	-	2 Parts
2. Hot water	-	4 Parts
3. Triphala Kwatha	-	1 Part

Powder of Shilajatu vigorously mixed with hot water so as to disengage the soluble matter, it is allowed to settle and the supernatant suspension is decanted and concentrated to thick paste or solid amorphus surface. The above extracted Shilajatu as such available in the market is subjected to further Shodhana. It is mixed with double the quantity of water and half the quantity of Triphala Kwatha and carefully boiled to dryness. Shodhana process should be done when there is no cloud in the sky. It should be done in summer season. The vessel taken for Shodhana should be of iron. For this purpose, four vessels should be used.

Karpura Gandhi Shilajatu Shodhana

एलातोयेन सम्भिन्नं सिद्धं शुद्धिमुपैति तत्।
(R.R.S. 2/124)

By doing Mardan using Ela Toya it get purified.

Shuddha Shilajatu Examination

बह्नौ क्षिप्तं भवेद्यत्तल्लिङ्गाकारमधूमकम्।
सलिलेऽप्यविलीनं च तच्छुद्धं हि शिलाजतु ॥
(R.R.S. 2/114)

Shuddha Shilajatu when subjected to fire it burns without missing Dhurma and becomes Lingakara. When it is dissolved in water it settles down at the bottom leaving thread like structure.

Shilajatu Marana

शिलया गन्धतालाभ्यां मातुलुङ्गरसेन च।
पुटितो हि शिलाधातुर्म्रियतेऽष्टगिरिण्डकैः ॥
(R.R.S. 2/119)

Shilajatu is ground with Manshila, Gandhaka and Haratala with the help of Matulunga Svarasa and pellets are made. Then it is subjected to Puta of eight Uplas.

Shilajatu Satva Patana

पिष्ट्वा द्रावणवर्गेण साम्लेन गिरिसम्भवम्।
क्षिप्त्वा मूषोदरे रुद्ध्वा गाढैर्धमातं हि कोकिलैः ॥
सत्त्वं मुञ्चेच्छिलाधातुस्तत्क्षणाल्लोहसन्निभम् ॥
(R.R.S. 2/122)

Shilajatu is ground with Dravana Varga with the help of Amla Drava then it is kept into Musha and strong heat is given by using coal as fuel. The Satva of Shilajatu looking like Lauha is obtained at the end of process.

Probable Physicochemical Changes- The following physico chemical values were noted in Shodhita Shilajatu.

Sr. No.	Physical constituents	Result
1.	Moisture content	1%
2.	Ash value	19.2%
3.	Acid insoluble ash	1%
4.	Water soluble ash	13.6%
5.	Specific gravity	1.005
6.	pH	6.5
7.	Percentage of solubility	74% (in DW)

Arya Elias, Pramod C. Bargi, Kashinath Hadimur, K.A. Patil, Khazi Rahimbi, Pharmaceutical analytical study of Shodhita Shilajatu. J Ayurveda Integr Med Sci. 2020; 5:214-219 http//dx.doi.org/10.21760/Jaims. 5.5.30.

Importance of temperature while processing-Due to the element present in the structure of Shilajatu, its purification method is affected by the heat of sun or the purify it on Manda Agni (low flam) so that it does not get destroyed. although there is mention of its Marana and Stava Patana, but is not prevalent in modern times.

Yoga

1. Arogyavardhini Vati
2. Chandraprabha Vati
3. Shiva Gutika
4. Shilajativadi Lauha
5. Sarva Arogya Vati

Research updates

- The origin and the process of transformation of Shilajatu in its natural habitat contribute to the odour of Shilajit i.e. smell of Cow's urine (Gomutra gandhi) or Camphor (Karpura-gandhi).
- Shilajit is composed of three primary chemical units-

1. Low and medium molecular weight non-humic organic compounds comprising free and conjugated (e.g. fatty acyl, aminoacyl, lipoidal) dibenzo-a-pyrones.
2. Medium and high molecular weight DCPs (Dibenzo-a-pyrons chromoproteins containing trace metal ions along with carotenoids and indigoids as colouring matter.
3. Metallo-humates like fulvic acids and fusims with dibenzo-pyrones in their core nucli.

- Composition of Shilajit is considered as phytocomplex, very rich in fulvic acid, researches hypothesize that it is produced by the decomposition of plant material from species such as Euphorbia royleana and Trifolium repens. It is composed mainly of humic substances including fulvic acid, that account for around 60 to 80% of the total nutraceutical compound and some oligo elements including seliniucm of antiaging properties.

Gandhaka (Sulfur)

In the field of Rasa, Gandhaka holds top position after the Parada. Without the combination of Parada with Gandhaka, most of Rasashastra compound formulation would not have been possible.

Synonyms

गन्धको गन्धपाषाणः गन्धौ च रसगन्धकः।
सुगन्धिको गन्धिकश्च गन्धः सौगन्धिकस्तथा॥
पूतिगन्धोऽतिगन्धश्च पामारिः कीटनाशनः।
बलिर्वलिवसाख्यश्च कुष्ठारिः शरभूमिजः॥
शुल्वारिर्नवनीतश्च दैत्येन्द्रो गन्धमादनः।

कीटघ्नः क्रूरगन्धश्च स एव परिकीर्तितः ॥
(R.T. 8/1-3)

Gandhaka, Gandha Pashana, Gandhau, Rasa Gandhaka, Sugandhika, Gandhika, Gandh, Saugandhika. Putigandhanka, Atigandha, Pamari, Keetnashan. Bali, Balivasa, Kusthari, Sharbhumij, Shulvari, Navneeta, Daiteyentra, Gandhamadana, Keetghana, Kruraganda are the synonyms of Gandhaka.

Physical properties

Nature	-	Crystalline lumps
Colour	-	Sulphur yellow
Streak	-	Yellowish white
Cleavage	-	Poor
Fracture	-	Conchoidal
Lusture	-	Resinous
Tenacity	-	Brittle
Transparency	-	Translucent
Hardness	-	1.5 to 2.5
Specific Gravity	-	1.95 to 2.10

Sources

Native Gandhaka occurs in the craters and crevices of extinct volcanoes where it has been deposited as a direct sublimation product from valcanic gases. It also occurs around thermal springs, in salt done cap-rocks and in sedimentary sequences that contain sulphates along with organic materials like bituminous limestone. Native Gandhak which is contaminated with sand or clay, bitumen and such foreign matter is purified by melting in oven or by distilling in closed vessels.

In India, the deposits of Gandhaka are very much limited. The only known occurrence is that of Tsokar lake, Leh district in Jammu and Kashmir. These is no mining for Gandhaka in India. Elemental Gandhaka, however, is recovered commercially as a byproduct from fertilizer plants at Panipat in Haryana, Naya Nangal and Bhatinda in Punjab and oil Refinery at Mathura in U.P. There are huge deposits of elemental Gandhaka buried underground especially in Poland, Mexico and USA.

According to Rasa Text

श्वेतद्वीपे पुरा देवि सर्वरत्नविभूषिते ।
सर्वकाममये रम्ये तीरे क्षीरपयोनिधेः ॥
विद्याधरीभिर्मुख्याभिरङ्गनाभिश्च योगिनाम् ।
सिद्धाङ्गनाभिः श्रेष्ठाभिस्तथैवाप्सरसां गणैः ॥
देवाङ्गनाभी रम्याभिः क्रीडन्तीभिर्मनोहरैः ।
गीतैर्नृत्यैर्विचित्रैश्च वाद्यैर्नानाविधैस्तथा ॥
एवं संक्रीडमानायाः प्राभवत्प्रसृतं रजः ।
तद्रजोऽतीव सुश्रोणि सुगन्धि सुमनोहरम् ॥
रजसश्चातिबाहुल्याद्वासस्ते रक्ततां ययौ ।
तत्र त्यक्त्वा तु तद्वस्त्रं सुस्नाता क्षीरसागरे ॥
धृता देवाङ्गनाभिस्त्वं कैलासं पुनरागता ।
ऊर्मिभिस्तद्रजोवस्त्रं नीतं मध्ये पयोनिधेः ॥
एवं ते शोणितं भद्रे प्रविष्टं क्षीरसागरे ।
क्षीराब्धिमथने चैतदमृतेन सहोत्थितम् ॥
निजगन्धेन तान्सर्वान्हर्षयन्सर्वदानवान् ।
ततो देवगणैरुक्तं गन्धकाख्यो भवत्वयम् ॥
(R.R.S. 3/2-9)

In the ancient times Devi Parvati, bearing all gems and jewelleries, was dancing at the Shweta Dweepa at the cost of Ksheera Sagar. During that time natural menstruation to her occurs and it was very beautiful and has pleasant smell. The cloth that Devi Parvati has bear became red due to massive Rajahsrava so she left it three and this cloth entered to Ksheera Sagar by means of tides of sea. Later it comes out during the process of Samudra Manthan. Deva and Daitya both becomes pleasured due to its smell so it was known as Gandhaka.

देव्या रजोभवेद्गन्धो- The Raja of Devi Parvati is Gandhaka

वलिवसा शब्द माहात्म्यम बलिना
सेवितः पूर्व प्रभूतबल हेतवे ।
वासुकिं कर्षतस्तस्य तन्मुखस्वालया द्रुता ॥
वसा गन्धकगन्धाढ्या सर्वतो निःसुता तनोः ।
गन्धकत्वं च सा प्राप्ता गन्धोऽभूतसविषस्ता ॥
तस्माद्वलिसेत्युक्तो गन्धकोऽति मनोहरः ॥
(Rasa.Chu. 11/6-7)

In the ancient time king Bali has used Gandhaka for obtaining immense strength. But during the time of Samudra Manthana Bali was pulling Vasuki. From the flame of Vasuki that comes out from his

mouth caused the melting of the fat of king Bali which was full of Gandhaka smell and comes out in the form of sweat from the body of Bali. This smelling material known as Gandhaka from that time onwards Gandhaka also became poisonous and known as Balivasa.

Types

According to superiority it is of three types :

स चापि त्रिविधो देवि शुकचञ्चुनिभो वरः।
मध्यमःपीतवर्णः स्याच्छुक्लवर्णोऽधमः प्रिये॥
(R.R.S. 3/12)

1. Shukachanchu like-Red colour-Shrestha
2. Pita Varna-Madhyam
3. Shukla Varna-Adhama

Gandhaka is also of four types

चतुर्धा गन्धको ज्ञेयो वर्णैः श्वेतादिभिः खलु।
श्वेतोऽत्र खटिका प्रोक्तो लेपने लोहमारणे॥
तथा चामलसारः स्याद्यो भवेत्पीतवर्णवान्।
शुकपिच्छः स एव स्याच्छ्रेष्ठो रसरसायने॥
रक्तश्च शुकतुण्डाख्यो धातुवादविधौ वरः।
दुर्लभः कृष्णवर्णश्च स जरामृत्युनाशनः॥
(R.R.S. 3/13-15)

Sr. No.	Varna	Name	Uses
1.	Shweta	Khatika	Lepa and Louha Marana
2.	Pita	Amlasar/Shu-kapichchha	Shrestha Rasa, Rasayana
3.	Rakta	Shukatunda	Dhatuvada
4.	Krishna	-	Jaramrituya Nashak

Allotropic Forms of Sulphur

Sulphur

- Amorphous
- Crystalline
- Colloidal
- Milk of Sulphur
- Monoclinic
- Rhombic
- Plastic Prismatic or (Octahedral or a Sulphur or b Sulphur)

Grahya and Agrahyata Lakshana

शुकपिच्छसमच्छायो नवनीतसमप्रभः।
मसृणः कठिनः स्निग्धः श्रेष्ठो गन्धक उच्यते॥
(A.P. 2/20)

Gandhaka having its colour like Shukapichchha (Yellow colour), Navneeta Prabha (Shining like butter), Mrisana (Soft touch), Kathina (Hard) and Snigdha (Smooth) is superior to all

Doshas

गन्धे मलंद्वयं दृष्टं शिलाचूर्ण विषं तथा।
(R.J.N. II part II Chap. p. 131)

1. Shila Churna
2. Visha are two Malas that are present in Gandhaka.

Shodhana

1. पयःस्विन्नो घटीमात्रं वारिधौतो हि गन्धकः।
गव्याज्यविद्रुतो वस्त्राद्गालितः शुद्धिमृच्छति॥
एवं संशोधितः सोऽयं पाषाणानम्बरे त्यजेत्।
घृते विषं तुषाकारं स्वयं पिण्डत्वमेव च॥
इति शुद्धो हि गन्धाश्मा नापथ्यैर्विकृतिं व्रजेत्।
अपथ्यादन्यथा हन्यात्पीतं हालाहलं तथा॥
(R.R.S. 3/20-21)

Gandhaka is melted with Cow's ghee then it is poured into earthen vessel which is filled with Cow's milk and a cotton cloth is tied to the mouth of this vessel. Now this Gandhaka is subjected to Swedana process for 1 Ghati. After that it is taken out and washed with lukewarm water. By doing this Shodhana process Gandhaka is free from stone etc. Visha present along with Gandhaka remains with in Ghee. Gandhaka Shodhita by this process does not causes any Vikriti even if one does not follow Pathya otherwise if it is ingested it is harmful as Halahal.

2. गन्धको द्राविते भृङ्गरसे क्षिप्तो विशुध्यति।
तद्रसैः सप्तधा भिन्नो गन्धकः परिशुध्यति॥
(R.R.S. 3/23

Gandhaka is melted and poured into Bhringraja Swarasa and taken out this process is repeated for seven times.

Probable Physico-chemical Changes

Characters	Raw Sulphur	Processed Sulphur
Colour	Shiny yellow	Yellow
Appearance	Highly crystalline, sharp	Amorphous, not sharp, no and shiny shiny
Texture	Hard, rough	Soft, Smooth
Melting point (^{0}C)	96	110
Density (g/cc)	2.07	1.95
Smell	Poul	No found smell
Sulphur concentration (%)	99.52	98.61

Rajalakshmy *et al.* Physico chemical Transformation of Sulphur during parmaceutical processing in Traditional Indian Medicine. Indian J. Pharm. Sci 2017;79(5);794-800.

Importance of temperature while processing

At a temperature below 960 C the shape of sulphur is rhombic where as temperature more than 960 C the form is monoclinic. It is important that at a temperature of 960 C or above the rhombic sulphur changes to prismatic or Kaleidoscopic sulphur below 960 C prismatic changes to rhombic sulphur.

Yoga

1. Rasa Parpati
2. Kajjali
3. Rasa Sindoora
4. Gandhaka Rasayana
5. Gandhaka Druti
6. Arogyavardhini Rasa
7. Svarna Vanga
8. Malla Sindoora
9. Shankha Vati
10. Makardhwaja

Research updates

Study done on Bhringraj Shodhita and Godugdha Shodhita Gandhaka, to see the immunomodulatory activity by Neutrophil Function Assay Test, both samples show significant Immunomodulatory effect. The comparison of both sample, from 5ml concentrations to 100 ml, it was found that there is no significant difference between sample 1 & 2 (P>0.05) over all.

Gaikwad B, Baragi P.C. Immunomodulatory effect of Bhringraj Swaras Shodhit Gandhak and Godugdha Shodhita Gandhaka: A comparative invitro study; Ayushdhara; March-April 2019; vol 6; (2) p 2079-2088.

Studies done on Shodhita Gandhaka, (Done by melting in ghee then pouring it into cow's milk for seven times) on modern technique like ICP-AES, XRD, SEM and analysied. The SEM images of both samples of sulphur show presence of an extraneous on the SEM surface image for raw sample and it was found to be absent in processed sample particle. In XRD the 2q values were observed in the range 23.74 to 29.340, typical of alpha Sulphur and were present in both pattern. The highly intense peak at 2q of 52.7 for a d=7.14 is observed in XRD pattern of raw sulphur were found to diminish to an intensity of 200 Lin counts in processed Sulphur. The finger printing region. 1400 cm-1 to 900 cm-1 for processed sulphur was observed to have a complex form compared to that for raw sulphur, which is indicative of presence of organic groups.

Rajalakshmy et. al physico chemical Transformation of Sulphur during Pharmaceutical processing in Traditional Indian Medicine. Indian J. Pharma Sci., 2017:79(5):794-800.

Gairika (Red Ochre)

Gairika is an ore of iron. It is also called as red oxide of iron. It is available in free form. Available in many pat of india and USA, Germany etc.

Synonyms

गैरिकं त्वथ गैरेयं गिरिमृद् गिरिमृत्तिका।
रक्तधातु र्लोह धातुस्तदेव गिरिमृद्भवम्॥
(R.T. 22/110)

Gairika, Gaireya, Girimritika, Girimrid, Rakta dhatu, Loha dhatu and Girimridbhava are synonyms of Gairika.

Mineralogical Identification

Nature	- Massive clayey
Colour	- Reddish brown
Streak	- Reddish brown
Fracture	- Uneven
Lustre	- Earthy
Tenacity	- Brittle
Transparency	- Opaque
Hardness	- 5.5 to 6.5 but much softer in earthy variety
Specific Gravity	- 2.7

Sources

Gairika (Hematite mineral) is a natural mineral pigment found with other iron-titanium oxide minerals in igneous and metamorphic rocks as accessory mineral. Gairika is associated with magnetite. Gairika occurs as an alternation product of other iron minerals or by degradation of highly ferruginous rocks in the form of weathered residual concentrations. It is generally found mixed with clay and other impurities.

In India, Gairika (Red ochre) is widely distributed. Gairika deposits are chiefly found in Rajur, Banaskantha, Jamnagar and Kuchcha in Gujarat. Bellary and Bidar in Karnataka. Gwalior, Jabalpur, Satna, Kailashpur, Madhogarh and Mandla in M.P. Udaipur, Alwar, Sawai Madhopur in Rajasthan.

Types

गैरिकं तु समाख्यातं द्विविधं रसकोविदैः।
पाषाणगैरिकं त्वाद्यं द्वितीयं स्वर्णगैरिकम्॥
(R.T. 22/111)

Gairika is of two types-

1. Pashana Gairika
2. Svarna Gairika

Depending upon colour ochres is found of two types in India

1. Red ochre - Anhydrous iron oxide
2. Yellow ochre - Hydrated iron oxide

Grahya Lakshana

सुवर्ण गैरिकं स्निग्धं मसृणं त्वतिकोमलम्।
पाषाण गैरिकं रूक्षं कठिनं नाति लोहितम्॥
पाषाण गैरिकात् श्रेष्ठं कथितं स्वर्णगैरिकम्।
अतः सर्वत्र मतिमान् योजयेत्स्वर्णगैरिकम्॥
(R.T. 22/112-13)

Svarna Gairika - Snigdha, Masrina, Atikomal and Red colour

Pashana Gairika - Ruksha, Kathina, Natilohit Varna.

Svarna Gairika is superior to Pashana Gairika and it should be used everywhere.

Shodhana

1. गैरिकं तु गवां दुग्धैर्भावितं शुद्धिमृच्छति।
(R.R.S. 3/49)

By giving Bhavana of Godugdha Gairika becomes Shodhita.

2. गव्याज्येन तु सम्भृष्टं यत्नतो मन्दबह्निना।
सुवर्ण गैरिकं शीघ्र शुद्धिमाप्नोत्यसंशयम्॥
(R.T. 22/115)

Frying with Cow's Ghee over mild heat Gairika becomes Shuddha.

Note- Frying method is good in comparison to Bhavana method. It can be done in any season. While there are chances of fungal growth in Bhawana method if it is not properly dried and packed.

Svarna Gairika is used in Shodhita form. Gairika Marana is not described.

Satva Patana

गैरिकं सत्त्वरूपं हि नन्दिना परिकीर्तितम्॥
कैरप्युक्तं पतेत्सत्त्वं क्षाराम्लस्विन्नगैरिकात्।
उपतिष्ठति सूतेन्द्रमेकत्वं गुणवत्तरम्॥
(R.R.S. 3/50)

According to Aacharya Nandi as Gairika is itself Satva Rupa so there is no need of its Satva Patana. According to other Acharyas by doing Swedana with Kshara and Amala its Satva is extracted.

Probable Physicochemical Changes

Sr. No.	Parameter	Mean of three batches
1.	Loss on Drying (%)	0.47
2.	Loss on Ignition (%)	17.56
3.	Acid insoluble Ash (%)	39.67
4.	Iron as Fe (% w/w)	18.92
5.	Silicon as Si (% w/w)	18.92

Importance of temperature while processing-While purifying the Gairika, the temperature should not be too high, otherwise there is a possibility of the properties of the ghee being destroyed.

Yoga

1. Pushyanuga Churna
2. Gairikadya Malhara
3. Irimedadi Taila
4. Mahajwarankusha Rasa
5. Vishamjwarantaka Lauha

Research updates

In their study done by Chavan et al. on Gairika Shodhana it was found that SEM analysis did not show any structural changes in both i.e. before and after Bharjana. Particle size of the agglomerates in both were in similar range. XRD pattern did not show any chemical and crystalline phase changes. FT-IR analysis shows addition bands in processed Red Ochre (Shodhita Gairika) as compared to raw that may be due to mixing or deposition of fat on the red ochre. The XRD analysis, showed prominent peaks simulation with that of Ferric oxide (Fe2O3) and Karolinite.

Study done in suckling and weaning rats by feeding then combination of iron with several types of fat shows that those consuming iron with saturated fat have higher Fe uptake and haemoglobin regeneration. This may be the reason for Shodhana of Gairika by Ghrita that is given in the texts of Rasa shastra

7. Kankshi (Alum)

Synonyms

स्फटिकारिः स्फुटी चैव स्फटिका स्फुटिकारिका।
स्फुटिका फटिका चैव शुभ्रा कांक्षी च रङ्गदा॥
दृढ़रङ्गा रङ्गदृढ़ा तथैव दृढरङ्गरा।
तुवरी रङ्गदात्री च कथिता भिषजां वरैः॥
(R.T. 11/178-79)

Sphatikari, Sphuti, Sphatika, Sphutikarika, Sphutika, Phatika, Shubhra, Kankshi, Rangda, Dridharanga, Rangadridha, Dhridhrangada, Tuvari and Rangadatri are synonyms.

Mineralogical identification

Nature - Small crystals are rare usually massive, granular to dense

Colour - White when pure, grey, yellow, red, reddish brown with impurities

Lustre - Vitreous to dull, Streak - white

Diaphaneity - Transparent to translucent, Cleavage - basal

Solubility - Soluble in water, insoluble in acetone

Hardness - 3.5 to 4

Specific Gravity- 2.6 -2.9

Density - 1.725 gm/cm^3

Chemical Formula: K_2SO_4, $Al_2(SO_4)_3$, $24H_2O$

Dose: 2-4 Ratti

Sources

In the Rasa texts it is found in Saurashtra Desha (Jamnagar Rajkota, Junagarh area of Gujarat comes under Saurashtra).

सौराष्ट्रमत्तिकैवेह निर्भरं निर्मलीकृता।
तच्छोधकैर्जनैलोके कथिता स्फुटिकारिका॥
(R.T. 11/180)

Special soil of Saurashtra is washed by water then this Shodhita soil is known as Sphatika in local language.

Potassium alum decahydrate occurs in nature as a sulfate mineral called alum-(k) typically as encrustations on rocks is areas of weathering and oxidation of Sulphide minerals and Potassium bearing minerals. Potassium alum is now produced industrially by adding potassium sulfate to a concentrated solution of aluminium sulfate.

Types

फटकी फुल्लिका चेति द्वितीया परिकीर्तिता ॥
(R.R.S. 3/60)

It is of two types- 1. Phataki, 2. Phullika

Grahya Lakshana

ईषत्पीता गुरुः स्निग्धा पीतिकाविषनाशिनी ।
व्रणकुष्ठहरा सर्वकुष्ठघ्नी च विशेषतः ॥
निर्भारा शुभ्रवर्णा च स्निग्धा साम्लाऽपरा मता ।
सा फुल्ला तुवरी प्रोक्ता लेपात्ताम्रं चरेदयः ॥
(R.R.S. 3/60-61)

Phataki - Kinchita Pita, Guru and Snigdha

Phullika- Low in weight, Subhra Varna, Snigdha, Amla with Lepa of this Tamra Bhasma can be made easily.

Shodhana

1. तुवरी काञ्जिके क्षिप्ता त्रिदिनाच्छुद्रिमृच्छति ॥
(R.R.S. 3/64)

Keeping it in Kanji for three days it's Shodhan is done.

2. .....लोका वह्नावुत्फुल्लयन्ति हि ।
(A.P. 2/258)

By doing Nijalikarana on fire it became Shodhita.

Marana

बह्नौ प्रोत्फुल्लयेत् किं वा सम्यग् लघुपुटे पचेत् ।
कुन्दवज्जायते भस्म सर्वरोगेषु योजयेत् ॥
(Para. Sam)

By subjecting it to fire or by giving Laghu Puta its Bhasma of white colour is prepared.

Satva Patana

क्षाराम्लैर्मर्दिता ध्माता सत्त्वं मुञ्चति निश्चितम् ।
(R.R.S. 3/65)

By grinding it with Kshara and Amala and then providing heat its Satva is extracted.

Probable Physicochemical Changes

Sr. No.	Parameter	Value
1.	pH	3.14
2.	Total Ash	70.5%
3.	Acid insoluble Ash	4%

Ambika et al: Pharmaceutico-Preliminary analytical study of Sphatika Shodhana by two different method, W.JPPS vol 9. Issue 9-2020, 2076-2084.

Importance of temperature while processing- The melting point of Alum is 92.50C. Therefore, High heat should not be given during purification, otherwise the crystal obtained will not be of white colour.

Yoga

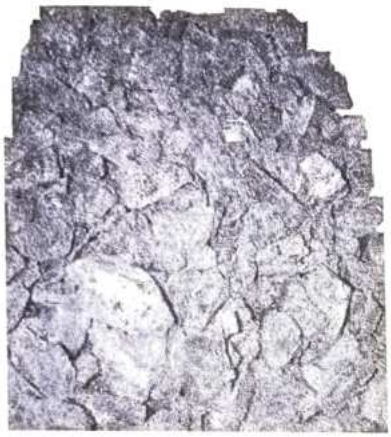
1.Shankha Drava
2. Shweta Parpati
3. Dravaka Rasa
4. Maha Dravaka Rasa
5. Sauveeranjan Churna

Research updates

In Vitro study of antimicrobial and antioxidant activities of Alum and its Bhasma (Sphatika bhasma-procured from local Ayurvedic shop) evaluated against 4 gram negative [E.coli [ATCC-101148), Klebsilla pneumoniae (ATCC-700603), Pseudomonas aeruginosa (Fisher's Immuno type iv), Salmonella typti (NCTC-786), 4 gram positive [Bacillus subtilis (ATCC-9372), Enterococcus faecalis (ATCC-29212), Methicillin Resistant Staphylococcus aureus (MRSA ATCC-25923), Sarcina lutea (NCTC-2470) and 2 Fungi (Aspergillus miger (ATCC-16404) and Candida albicans (ATCC-102313) using MIC, MBC/MFC

and Ager well Diffurion method. It was found that Alum and Sphatika Bhasma both have broad spectrum antibacterial activities inhibiting gram positive as well as gram negative organism and moderate antifungal activities. It was also found that Sphatika Bhasma exhibit better antimicrobial and antioxidant activities then Alum.

8. Haratala (Orpiment)



Haratala is an inorganic compound, which is golden yellow in colour. It is used in Ayurveda in small doses after purification. It is a chemical compound of arsenic and sulphur.

Synonyms

हरितालं मतं तालं तालकं नटभूषम्।
नटमण्डनकञ्चापि मतं शैलूषभूषणम्॥
विडालकं चित्रगन्धं पिञ्जरं वंश पत्रकम्।
आलं पीतनकञ्चापि कथितं मल्लगन्धजम्॥
तालकं जायते यस्मान्मल्लगन्धक मिश्रणात्।
तस्माद्विषवरैरेतन्मल्ल गन्धजमुच्यते॥
(R.T. 11/1-3)

Haritala, Tala, Talak, Natabhushana, Natamandanaka, Shaileshu bhushana, Vidalaka, Chitragandha, Pinjara, Vamshapatraka, Aala, Pitanaka and Malla Gandhaja are synonyms of Haratala. Haratala is combination of Mala (As) and Gandhaka (S) so Vaidyas term it as Mall Gandhaja.

Mineralogical Identification

Lusture - Pearly
Colour - Orange yellow - Lemon yellow
Streak - Light lemon yellow
Tenacity - Sectile
Clevage - Perfect
Hardness - 1.5-2.0
Special Gravity - 3.49

Sources

Orpiment is found in hydrothermal veins in hot spring deposits and volcanic fumaroles. It is found associated with realgar and stibnite. Its deposits are found in Crech Republic, Romania, Germany, Italy, Iran Japan, USA etc. countries.

Types

तालकं द्विविधं ख्यातं रस सिद्धैः पुरातनैः।
प्रथमं पत्रतालं स्याद् द्वितीयं पिण्डतालकम्॥
(R.T. 11/4)

It is of two types

1. Patra Haratala
2. Pinda Haratala

Grahya Lakshana

स्वर्णवर्णं गुरु स्निग्धं तनुपत्रञ्च भासुरम्।
तत्पत्रतालकं प्रोक्तं बहुपुत्रं रसायनम्॥
(R.R.S. 3/66)

Patra Haratala having Svarna Varna (Golden yellow), Guru (Heavy), Snigdha (Smooth), Tanupatra (Thin layer), Bhasura (Brightness), Bahu Patra (Composed of many layers) is superior and having Rasayana Guna.

निष्पत्रं पिण्डसदृशं स्वल्पसत्त्वं तथा गुरु।
स्त्रीपुष्पहरणं तत्तु गुणाल्पं पिण्डतालकम्॥
(R.R.S. 3/67)

Pinda Haratala is Patra Rahita, Pinda like, Swalpa Satva and Guru. It has property of Stri Pushpa Harana. It is inferior to Patra Haratala

Shodhana

1. स्विन्नं कूष्माण्डतोये वा तिलक्षारजलेऽपि वा।
तोये वा चूर्णसंयुक्ते दोलायन्त्रेण शुद्ध्यति॥
(R.R.S. 3/70)

By doing Swedana in Dola Yantra using Kushmanda Svarana, Tilakshara, Jala or

Churnodaka as liquid media Haratala becomes Shuddha.

2. तालकं कणशः कृत्वा दशांशेन च टङ्कणम्।
जम्बीरोत्थद्रवैः क्षाल्यं काञ्जिकैः क्षालयेत्ततः ॥
वस्त्रे च चतुर्गुणे बद्ध्वा दोलायन्त्रे दिनं पचेत्।
(R.R.S. 3/71-72)

Haratala is made into small pieces then 1/10 part of Tankana is added to it. Now it is washed with Jambiri Nimbu Swarasa and Kanji. Then it is kept in four folded Pottali of cotton cloth and Swedana is done for one day by using Dola Yantra.

Marana

पत्राख्यं तालकं शुद्धं पौनर्नवरसेन तु।
खल्वे विमर्दयेदेकं दिनं पश्चाद्विशोषयेत्॥
संशोष्य गोलकं कृत्वा चक्राकारमथापि वा।
ततः पुनर्नवाक्षारैः स्थाल्यामर्धं प्रपूरयेत्॥
तत्र तद्गोलकं कृत्वा पुनस्तेनैव पूरयेत्।
स्थाली चुल्यां समारोप्य क्रमाद्वाह्नि विवर्धयेत्॥
दिनान्यन्तरशून्यानि पञ्च वह्निं प्रदीपयेत्।
एवं तन्म्रियते तालं मात्रा तस्यैक रक्तिका॥
(A.P. 2/184-87)

1. Suddha Patra Haratala - 1 Part
2. Punarnava (Rakta) Swarasa - Q.S. (For Bhavana)
3. Rakta Punarnava Kshara - Q.S. (For Yantra Poorna)

The Shodhita Haratala is ground well in Punarnava Swarasa for seven days and one Chakrika of the entire quantity is prepared. The Chakrika is dried. Half of Punarnava Kshara is filled in a Sthali and the Chakrika is placed over it the other half of the Punarnava Kshara is placed over the Chakrika. Another Sthali is placed and the edge is sealed well. This is to be placed over an oven and heated with Krama Vriddhi Agni for five days continuously.

- Shuddha Haratala is given 12 bhavana with Ashwattha Twak Kwatha. Cakes are prepared and dried. It is taken inside a Bhasma yantra, filled with Ashwattha Twak Bhasma and subjected to Madhyamagni for 12 hours, to get Haratala Bhasma.
- Shuddha Haratala is given Bhavana with Highly concentrated Palasha Kwatha for three times, then one Bhavana is given with Mahishamutra, cakes are prepared, dried. It is subjected to heat with 10 Cow dung cakes for 12 times.
- Shuddha Haratala is given Bhavana with Kumari swarasa and cakes are prepared. Kept in Sharava Samputa, and subjected to heat for 12 Yamas. (12 X 3 hours) to get Tala Bhasma, useful in chronic skin diseases.

Other processing techniques

Satva Patana

पलालकं रवैर्दुग्धैर्दिनमेकं विमर्दयेत्।
क्षिप्त्वा षोडशिकातैले मिश्रयित्वा ततः पचेत्॥
अनावृतप्रदेशे च सप्तयामावधि ध्रुवम्।
स्वाङ्गशीतमधःस्थञ्च सत्त्वं श्वेतं समाहरेत्॥
(R.R.S. 3/80-81)

One Pala of Haratala is levigated with Arka Dugdha for one day. Then one Pala of Tila Taila is added to it and subjected to heating process for seven Yama by means of Baluka Yantra. When it is self-cooled after having it yields white coloured Satva at the bottom of earthen pot.

- Haratala is given individual Bhavana with Kulattha Kwatha, Tankana Drava (solution), Buffalo ghee and honey and a mass is prepared. Taken in a strong pot, covered with a lid with a hole and sealed. Hole is sealed with cow dung. Heat is given for three hours with Mrudu, Madhyama and Tivragni. After that, the hole is opened, and watched for fumes. If fumes are whitish coloured, then heating is stopped. After self-cooling, the Tala Satwa collected at the bottom of the pot is taken.
- Shuddha Haratala is kept dipped in Kumari Swarasa for seven days. Then it is dried and taken in a Kupi kept in Valuka Yantra and subjected to Mrudu and Madhyama Agni for seven days and the Tala Satwa collected at the neck of the Kupi is collected.

Physico chemical changes during the process of Shodhana in different media in shown as follow.

Sr. No.	Parameter	Ashuddha Haratala	Kanji Shodhita Haratala	Triphala Kwatha Shodhita Haratala
1.	Loss on drying(w/w)	0.6	0.7	18.1
2.	Ash value (w/w)	1.35	0.9	5.65
3.	Acid insoluble ash	2.701	0.55	3.4146
4.	As% (AAS) AAS-Atomic Absorption spectroscopy	19.89	6.50	8.21

Importance of temperature while processing- Orpiment melt at the 3000C mes 3250C. While purifying Haratala by Swedana method. The temperature of the liquid is kept between 900-950C. Whereas Rasa Manikya which made by melting Haratala, its temperature is 4500C-6500C in Manufacturing method by Abhraka Patra Samputa Vidhi and 3590C melting temperature and 4500C in the manufacturing method by Kupi Pakva.

- Srimannarayan K, Patgiri BJ, Prajapati PK. Process Standardization of Rasamanikya. Ayu. 2010 Jan; 31(1):7-11.doi 10.4103/0974-8520.68195. PMID:22131676; PMCID:PMC 3215326.
- Gaidhani Sudesh N. et al. Validation and Quality assessment of Rasamanikya-A classical herbo mineral preparation. J Sci Ind Ras : vol 70: October 2011; pp 871-874.

Yoga

1. Rasa Manikya
2. Tala Sindoora
3. Nityanand Rasa
4. Sameer Pannag
5. Vata Gajankusha Rasa

Dosage- $^1/_4$-$^1/_2$ Ratti (31.25 to 62.5 mg per day with divided doses.

Research updates

XRD data of different samples of Shodhita Haratala, with the standard by following the Hanawalt analysis and Fink method, identified as AS2S3 (Monoclinic).

Haratala Bhasma prepared by Shodhita Haratala by Dolayantra using Chmnodaka as liquid following the Swedana method for three hours. After that 21 Bhavana was given with the decoction of Ficus religiosa bark and Bhasma was prepared by Bhasma Yantra using ash of bark of Ficus religiosa. The chemical analysis of the obtained Haratala Bhasma shows ash valve (w/w%) 99.10, Acid insoluble as (w.w%) 10.28 and sulphur as S (w/w%) 20.914.

Manashila (Realgar)

Manashila is a Uparasa according to Rasa Shastra. It is mainly used in the urinary disorders, toxic condition, ingestion etc. Chemical formula of Manashila is Arsenic disulphide AS_2S_2. It has bright orange red color and soft monoclinic crystalline structure.

Synonyms

मनःशिला रोगशिला शिला नैपालिका तथा।
मनोगुप्ता मनोज्ञा च मनोह्वा नाग जिह्विका॥
कुनटी कुलटी गोला नागमाता च सा मता।

कल्याणिका च सैवह कथिता रसनेत्रिका ॥
(R.T.11/104-05)

Manhshila, Rogashila, Shila, Naipalika, Manogupta, Manogya, Nagjihvaka, Kunati, Kulati, Gola, Nagmata, Kalyanika and Rasanetrika are synonym of Manhshila.

Mineralogical Identification

Crystam system	- Monoclinic
Colour	- Red to Yellow
Twinning	- Contact twins
Clevage	- Good
Streak	- Red orange
Luster	- Resinous to pearly
Hardness	- 1.5 to 2
Specific Gravity	- 3.56

Sources

Realgar is normally found in the form of low temperature hydrothermal vein together with arsenic and other Antimony mineral. It is also found in magma and hot springs. It also found associated with Haratala, Arsenolite, Calcite etc. Hungury. United states of America, China and Spain etc. are the country from where it is found. In India, it is available in Kumayun Dist. And Chitrala.

Types

मनःशिला त्रिधा प्रोक्ता श्यामाङ्गी कणवीरका।
खण्डाख्या चेति तद्रूपं विविच्य परिकथ्यते ॥
(R.R.S. 3/88)

It is of 3 types-

1. Shyamangi
2. Kanavirka
3. Khandakhaya

श्यामा रक्ता सगौरा च भाराढ्या श्यामिका मता।
तेजस्विनी च निर्गौरा ताम्राभा कणवीरका ॥
चूर्णीभूताऽतिरक्ताङ्गी सभारा खण्डपूर्विका।
उत्तरोत्तरतः श्रेष्ठा भूरिसत्त्वा प्रकीर्तिता ॥
(R.R.S. 3/89-90)

- Shyamangi- Shyam, Rakta and Gaura, Heavier in weight
- Kanavirka- Tamrabha, bright, Nirgaura
- Khandakhya- Excessive red colour, Churna Rupa, Heaviest of these three Khandakhya is of best quality.

Grahya Lakshana

मनःशिला शिलाखण्ड शून्या रक्तोत्पलप्रभा।
भारे गुरुतरा दीप्ता शोधनार्हा मता बुधैः ॥
(R.T. 11/10)

Manhshila free from stones, having colour to that of Rakta Utpala, more in weight and bright should be taken for Shodhana.

Shodhana

1. अगस्त्यपत्रतोयेन भाविता सप्तवारकम्।
शृङ्गवेररसैर्वाऽपि विशुद्ध्यति मनःशिला ॥
(R.R.S. 3/93)

By giving Bhavana with Agastya Patra Swarasa or Shringabera Swarasa for seven times Manashila becomes Shuddha.

2. सुधोदके निपातिता मनःशिला तु चूर्णिता।
दिनत्रयाद्विनिर्गता भवेत्तु दोष वर्जिता ॥
(R.T. 11/109)

By dipping it into Churnodaka for seven days it becomes Shuddha.

Satva Patana

अष्टमांशेन किट्टेन गुडगुग्गुलुसर्पिषा।
कोष्ठ्यां रुद्ध्वा दृढं ध्माता सत्त्वं मुञ्चेन्मनःशिला ॥
(R.R.S. 3/95)

- Manashila is added with 1/8-part Mandura, Guda, Guggulu and Ghrita and mixed well, are kept together with in a Musha and then by providing strong heating yields Satva of Manashila.
- Manashila is mixed with Bhunaga Satwa, Tankana, Madanaphala, given Bhavana with Karavellaka Swarasa mass is formed, dried, kept in Musha and subjected to intense heat to get its Satwa.

Probable Physicochemical Changes

The Shodhana of Makshika of Khandakhya variety processed (Triturated) with Adraka Swarasa for seven times in seven days was done. Shodhita Manashila was analysed on various physicochemical parameter. The result as follows-

Sr. No.	Parameters	Value
1.	Loss on drying at 110C (w/w)	0.5325%
2.	Loss on ignition (w/w) at 4500-5500C	95.0686%
3.	Ash value (w/w)	4.9544%
4.	Water insoluble ash (w/w)	4.1978%
5.	Acid insoluble ash (w/w)	0.5008%

Importance of temperature while processing

The melting point of Manashila is 3200C. Manashila is mainly used in the form of pure through various Yogas. Purification by Bhavana method is done at room temp. only.

Yoga

1. Shila Sindoora
2. Sameerpannaga
3. Somnathi Tamra
4. Shwaskuthar Rasa
5. Manhshiladi Dhooma

Research updates

Study done by Sharma Vinamra et.al on the Shodhana of two samples of Manhshila identified as Kanavirak and Khandhakya by Bhavana using freshly extracted ginger juice. The process was repeated for seven times. After that all the four were analysed on modern tool. XRD study classifies Knavirak as alacranite and Khandabhya as realger. While EDXA confirms 51.33% and 68.14% of arsenic in alacranite and realger samples respectively. SEM study of M3 (Shuddha Manhshila-Khandhakya variety) shows minimum size of half of the particles range from 400-800 nm (with maximum size. 15:55 nm).

Kampillaka (Mallotus Philippinensis)

Synonyms

काम्पिल्लः कर्कशश्चन्द्रो रक्ताङ्गो रोचनोऽपि च ॥
(Bh.P.Hari. 147)

Kampilla, Karkash, Chandra, Raktanga and Rochana are synonym to Kampillaka.

Sources

सौराष्ट्रदेशे चोत्पन्नः सहि कम्पिल्लकः स्मृतः ॥
(R.R.S. 3/122)

According to Rasa Ratna Samuchchaya it is found in Saurashtra region. In India it is normally found in hot climate of Himalaya region in east and Sindu to south at various places.

Tree is of medium size having 20 to 25 Feet in length. Leaves are 3 to 9 inches long. Oval, Spiny, odd and its dorsal surface having reddish hairs. Flowers are small size which when ripened it is covered with red coloured Rajah. This is being collected and known as Kampillaka. (Glands and hair on fruit).

Grahya Lakshana

इष्टिका चूर्ण सङ्काशश्चान्द्रिकाढयो.....॥
(R.R.S. 3/122)

Superior quality of Kampillaka is red in colour (that of brick colour) and have shining (Chandrika Yukta).

The Kampillaka is examined as follows:

1. When it is dipped into water it is not soluble but it floats on the surface of water. If it is mixed with brick powder then brick powder settle down at the bottom.
2. It bursts on fire.
3. It draws yellow line on white paper with wet finger.
4. It is soft in touch.

Shodhana

साधारणरसाः सर्वे मातुलुंगार्द्रकाम्बुना ।
त्रिवारं भाविताः शुष्का भवेयुदोषवर्जिताः ॥
(A.F.I. Part I p.363)

1. Kampillaka (Glands and hair on fruit) - 1 Part
2. Matulunga Rasa - Q.S.
3. Adraka Rasa - Q.S.

Bhavana is given three times with ingredients 2 and 3 separately.

Dosage- 1- 2 gm.

Yoga

1. Krimi Ghatini Gutika
2. Kampillaka Malhara
3. Bindu Ghrita
4. Mahodaya Pratayaysar Rasa
5. Gagana Garbha Vati

Research updates

Mallotus Phillippenesis (Lam), mostly found in India sub continent is one of the endangered plant of control eco region. Its whole part is rich in secondary metabolites having medicinal use. Fruit of this plant contain Rottlerin (Reddish-Yellow resin) 47.80% fixed oil 5.83-24%, citric acid, mallotoxin, Kamalin.

The crude powder obtained as a glandular pubescence from the exterior of fruits is found to be useful in case of worm, hook worm, earth and round worms. Anti helminthic activity is due to rottlerin and isollorotterin.

Navasadara (Ammonium chloride)

Third mineral drug of Sadharana Rasa. Chemically ammonium chloride (NH_4CL). Inorganic white crystalline salt highly soluble in water and mild soluble in acidic.

Synonyms

नवसारो नव्यसारस्तथैव नवसादरः ।
नृसादरो नृसारश्च नरसारश्च कीर्तितः ॥
किट्टक्षारो निगदितस्तथैव नरसादरः ।
चूलिका लवणं ख्यातं चुल्लिका लवणञ्च तत् ॥
(R.T. 14/1-2)

Navasara, Navyasara, Navasadar, Nrisadara, Nrisara, Narasara, Kitta Kshara, Narasadara, Chulika Lavana and Chullika Lavana are synonyms to Navasadara.

Mineralogical identification

Colour	- Colorless, White, Grayish, Yellow
Density	- 1.5
Diaphaneity	- Transparent
Odour	- Characteristic odour of ammonia
Touch	- Soft
Appearance	- Powder
Taste	- Alkaline

Sources

करीरपीलुकाष्ठेषु पच्यामानेषु चोद्भवः ।
(R.R.S. 3/127)

जायते चेष्टिकापाक दहने पाण्डुर प्रभः।
मनुष्य सूकराणां च विष्ठान्तः किट्टवद्भवेत्॥
(A.P. 2/338)

It occurs during roasting of bricks. It is produced as a by product of burnt woods of Karira and Pilu plants. It also obtained from the residue of burnt faecal matter and urine of man and animals. It is obtained from Punjab. It is obtained from volcanic area of Itali

Grahya Lakshana of Navasara

इष्टिकादहने जातं पाण्डुरं लवणं लघु।
तदुक्तं नवसाराख्यं चूल्लिकालवणञ्च तत्॥
(R.R.S. 3/128)

It is produced during roasting of bricks. It is Pandu (Yellowish white) Varna having salty taste, Laghu. It is also known as Navasara and Chulika lavana. Because it is collected from the ash after burning from Chullika so named as Chullika Lavana.

Shodhana

नवसारन्तु सलिले त्रिगुणे द्रावयेद्भिषक।
वस्त्रपूतं ततः कृत्वा भाजने स्थापयेत्ततः॥
चुल्लिकायां निधायाथ पचेत्तीव्राग्नि भृशम्।
जले शुष्के तलस्थञ्च नृसारं विमलं हरेत्॥
(R.T. 14/3-4)

One-part Ashuddha Navasadara is dissolved into three times of water and filtered by using cotton cloth then it is heated till evaporation of water. After complete evaporation white coloured Shuddha Navasadara is obtained.

Satvapatana

विमलं कङ्गिनीचूर्णो तोलकत्रितयोन्मितम्।
विशुद्धं नवसारश्च चतुस्तोलकसंमितम्॥
खल्वै सम्पेष्य यत्ने तु पचेद्धमरुकाभिधे।
नृसाररत्वं विशदमूर्ध्वलग्नं समाहरेत्॥
(R.T. 14/20-21)

Ingredients-

Shuddha Khatika - 3 Tola
Shuddha Navasadara - 4 Tola

Both are mixed and powdered then heating is done by using Damru Yantra it yields Satva inside upper earthen vessel of Damru Yantra.

Probable Physicochemical Changes

Sr. No.	Parameters	Value
1.	pH value	10.1
2.	Loss on drying	14%w/w
3.	Ash value (w/w)	0.099%
4.	Acid insoluble ash (w/w)	Nil
5.	Specific Gravity	1.0046

Importance of temperature while processing- Ammonium chloride is an inorganic compound and a neutral salt and it does not completely dissociate when added to water. As temperature rises the dissociation of ammonium chloride rises increasing its solubility. That is why during Shodhana of Ammonium chloride in water the vessel becomes cool due to endothenic reaction.

Dosage - 2-8 Gunja (250mg to 1gm)

Yoga

1. Shweta Parpati
2. Shankha Drava
3. Suchikabharana Rasa
4. Tikshna mukha Rasa

Research updates

Ammonium chloride is used as an expectorant in cough. Its expectorant action is caused by irritative action on the bronchial mucosa, resulting into the production of excess respiratory tract fluid, which presumably is earlier to cough up. (en.m.wikipedia.org).

The Navasadara satva showing significant antimicrobial activity against tested organisms, substantiating the use of Navasadara satva in the management of common infections, caused by these tested organisms.

Hingula (Red Cinnabar-HgS)

Synonyms

हिङ्गलो हिङ्गुलश्चैव हिङ्गुलं चेङ्गुलाह्वयम्।
म्लेच्छं रक्तं सुरङ्गञ्च चित्राङ्ग चूर्णपारदम्॥
रसोद्भवो रसस्थानं रञ्जनं कपिशीर्षकम्।
रक्तकायो हंसपादो दरदञ्च प्रकीर्तितम॥
(R.T. 9/1-2)

Hingula, Hingala, Ingula, Malechchha, Rakta, Suranga, Chitranga, Churna Parada, Rasodbhava, Rasasthan, Ranjana, Kapishirshaka, Raktakaya, Hamsapada and Darada are synonyms of Hingula.

Mineralogical Identification-

Colour	- Cochineal Red towards brownish red
Twinning	- Simple contact twins
Cleavage	- Perfect, Prismatic
Fracture	- Uneven-Sub conchoidal
Tenacity	- Slightly sectile
Streak	- Scarlet
Hardness	- 2.0 to 2.5
Specific Gravity	- 8.176

Sources

Cinnabar is normally found in the form of vein filling mineral around volcanic areas and alkaline hot springs. It is found with Stibnite, Realgar and Pyrite etc. It is found in Spain, Italy, California, Peru etc. countries. It contains 86.2% mercury and 13.8% sulphur.

Types

Rasa Ratna Samuchchaya has described its two types.

हिङ्गुलः शुकतुण्डाख्यो हंसपादस्तथाऽपरः।
प्रथमोऽल्पगुणस्तत्र चर्मारः स निगद्यते।
श्वेत रेखः प्रवालाभो हंसपादः स ईरितः॥
(R.R.S. 3/142)

1. Shukatunda- Also known as Charmara. It is Alpa Guna.
2. Hamspada- Having Shweta Rekha and Pravalabhaha.

According to Rasatarangini

प्रथमः खनिजोऽन्यस्तु कृत्रिमो हिंगुलो मतः।
खनिजः खनितो जातः कृत्रिमो रसगन्धजः॥
(R.T. 9/4)

1. Khanija - Obtained from mines
2. Kritrima- Prepared with Parada and Gandhaka.

According to Ayurveda Prakasha

1. Charamara- Avara- Sukavarna
2. Sukathunda- Madhyama- Pita varna
3. Hamsapada- Pravara- Japakusuma Samkasa

Grahya Lakshana of Hingula

जपाकुसुमवर्णाभः पेषणे सुमनोहरः।
महोज्ज्वलो भारपूर्णो हिंगुलः श्रेष्ठ उच्यते॥
(R.T. 9/3)

Hingula which has colour of Japa Pushpa (Hibiscus rosa flower) shines brightly, have weight and attractive on being ground is considered as best quality Hingula.

Shodhana

1. सप्तकृत्वाऽऽर्द्रकद्रावैर्लकुचस्याम्बुनाऽथ वा।
शोषितो भावयित्वाऽथ निर्दोषो जायते खलु॥
(R.R.S. 3/142)

Hingula becomes Suddha by giving seven Bhavana of Adraka Swarasa or Lakucha Swarasa.

किमत्रचित्रं दरदः सुभाविताः क्षीरेण मेष्या बहुशोऽम्लवर्गः।
एवं सुवर्णं बहुघर्मतापितं करोति साक्षाद्वरकुङ्कुमप्रभम्॥
(R.R.S. 3/143)

If Hingula is Bhavita with sheep milk, Nimbu Swarasa or Kanji and then dried in Sunlight then it becomes Suddha and Keshar Varna. There is no doubt in it.

Marana

हिङ्गुलं तनुवस्त्र कञ्चुकगतं कृत्वा, पटरञ्जन कन्द मध्यस्थं कृत्वा, मृदा संवेष्टय, पुटपाक विधानेन दशवनोपलैः पुटेत, एवं शतपुटानि। ततः शतपुटान्येवं वनवृन्ताकस्य, ततः शतपुटान्येव मन्दारफलस्य, ततः शतपुटान्येवमिन्द्रवारुणिकाफलस्य, ततः शतपुटान्येवमम्लवेतसफलस्य, ततः सिद्धो जातश्चात्यरूणवर्णो भवति। (A.P. 2/76)

Hingula is wrapped in cloth and then this cloth is folded to make ball shaped. This ball is kept in side Nilakanda and layer of mud having thickness of one Angula is smeared on it and then Puta of 10 Uplas is given. This process is repeated for hundred times. The process is repeated with Vanavrintaka, Madar, Indravaruni and Amalvetasa. At the end Arun varna Bhasma is obtained.

Satva Patana

दरदः पातनायन्त्रे पातितश्च जलाश्रये।
तत्सत्त्वं सूतसङ्काशं जायते नात्र संशयः॥
(R.R.S. 3/144)

Parada like Satva is obtained when Satva Patana process is done with the help of Patna yantra.

Probable Physicochemical Changes

Analysis of Hingula before and after Shodhana was done by Bhavana process using Adraka Swarasa and the process was repeated for seven time. The following physicochemical changes were observed-

Tests	Raw Hingula	Purified Hingula
pH (1% Aqueous suspension)	5.82	6.11
Loss on Drying at 105^{0}C	0.29%w/w	0.58 w/w
Total Ash	0.0079%w/w	3.7237% w/w
Acid in soluble Ash	0.00263% w/w	2.4127% w/w
Solubility in water	Insoluble	Partially soluble
Hg	78.944%	80.743%

Pharmaceutical Analytical study of Hingula (Cinnabar) purified with Adraka Swarasa (Juice of Zingiber officinall Rosc.). Mehar et al. Int J. Ayu Pharm Chem 2018 Vol.9 Issue 3 pp 376-388.

Importance of temperature while processing and Research update

Cinnabar (Mercury Sulphide, HgS) decomposes into mercury and sulphur at a temperature of 5800C. Research studies show that solubility and bioavailability of Cinnabar is quite different from mercury vapour, mercuric chloride and methyl mercury. Cinnabar has quite different toxicology potentials and it is very important for appropriate safety assessment of mineral cinnabar used in traditional medicine.

Dosage- 60-125 mg

Yoga

1. Hingulashwar Rasa
2. Anand bhairava Rasa
3. Tribhuvankriti Rasa
4. Vasantmalti Rasa
5. Kanaka sundar Rasa

Swarna (Gold)

Synonyms

स्वर्णं सुवर्णं कनकं हिरण्यं हेम हाटकम्।
तपनीयं कलधौतं गाङ्गेयं भर्म काञ्चनम्॥
चामीकरं शातकुम्भं तथा कार्तस्वरं च तत्।
जाम्बूनदं जातरूपं महारजतमित्यपि॥
(A.P. 3/21-22)

Svarna, Suvarna, Kanaka, Hiranya, Hema, Hataka, Tapniya, Kaldhauta, Gangeya, Barma, Kanchana, Chamikar. Shatakumbha, Kartasvara, Jambunada, Jatarupa and Maharajata are synonyms to Svarna.

Metallic Identification- [Au]

Nature	- Granular, dentrites and nuggets
Colour	- Golden yellow
Streak	- Bright yellow
Cleavage	- None
Fracture	- Hackly
Lustre	- Metallic
Tenacity	- Very malleable and ductile
Transparency	- Opaque
Hardness	- 2.5 to 3.0
Specific Gravity	- 19.30
Melting point	- 1064^{0}C

Sources

Rasa Ratna Samuchchaya has described about its origin as follows -

1. **Prakrita-** It originates from Rajoguna and covered entire Bhahmanda.
2. **Sahaja-** It covered Brahma as Jarayu at the time of his birth.
3. **Bahni Sambhuta-** It has originate as a result of vomitting by God Agni who did not bear the semen of God Shiva in his mouth.
4. **Khanija-** Which is obtained from mines and it is used to remove diseases.
5. **Rasendra Vedajanya-** As a result of Vedha Samskar by using Parada.

Gold is found in earth crust as well as sea water. Mostly it is found in earth crust in native form. It is found in two types of deposits-

1. Hydrothermal vein
2. In the form of placers

Svarna of hydrothermal origin occurs mostly in quartz veins, commonly with pyrite and other sulphides and gold-silver telluride. The primary deposits of Svarna occur in intrusive rocks having composition of diorite, quartz-diorite and granites and their metamorphic equivalents. Placers of Svarna occurs as rounded or flattened grains and nuggets, in many cases in association with other heavy and resistant minerals. Large quantity of Svarna is obtained from sulphides. In India the deposits of primary Svarna occur mainly in Hassan and Chitradurga districts in Karnataka. Chigagunta in Andhra Pradesh and Kozhikode and Cannore districts in Kerala.

Types

प्राकृतं सहजं बह्निसम्भूतं खनिसम्भवम्।
रसेन्द्रवेध सञ्जातं स्वर्णं पञ्चविधं स्मृतम्॥
(R.R.S. 5/2)

1. Prakrita
2. Sahaja
3. Bhinsambhuta
4. Khanisambhava
5. Rasendravedhajanya

Prakrita, Sahaja and Bahinsambhuta Svarna are sixteen Kala Yukta. These are capable of providing Ajarta and Amarta. Khanisambhava Svarna is fourteen Kala Yukta and capable of destroying all the diseases. Parada Vedhajanya variety is Mahashrestha and Mahapavitra and Rasayana.

Grahya Lakshana of Swarna

दाहे रक्तं सितं छेदे निकषे कुङ्कुमप्रभम्।
तारशुल्वोज्झितं स्निग्धं कोमलं गुरु हेम तत्॥
(A.P. 3/23)

Svarna which becomes red on heating, white on cutting yellow like Kumkum on rubbing over Nikesa (Touching stone), free from Tara and Shulva Dosha, Snigdha, Komal and Guru is accepted for all purpose.

Agrahya Lakshana of Swarna

यच्छ्वेतं कठिनं रूक्षं विवर्णं समल दलम्।
दाहे छेदे सितं, श्वेतं कषे त्याज्यं लघु स्फुटम्॥
(A.P. 3/24)

Svarna which is Shweta, Kathina, Ruksha, Vivarna, Samala and Dalayukta, White on cutting as well as heating, Shweta on rubbing over Nikesa, Laghu and Sphutam is Aghrahya.

Note- दलं नाम यद् घनाहतं स्फुटति । (A.P. 3/24)

Dala means breaking on impact because gold cannot break on heavy impact so Dala is taken as Agrahya Lakshana.

Shodhana

Samanya Shodhana of Svarna is done by heating and immersing Svarna Patra for seven times in each of the drug Taila, Takra, Gomutra, Aarnala and Kullatha Kwatha one after the other.

Vishesha Shodhana

1. कर्ष प्रमाणं तु स्वर्ण पत्रं शरावरुद्धं पटुधातुयुक्तम् ।
अङ्गारसंस्थं प्रहरार्धमानं ध्मातेन तत्स्यान्ननु पूर्णवर्णम ॥
(R.R.S. 5/12)

Lepa of Saindhava Lavana and Svarna Gairika is smeared on one Karsha of Svarna Patra then it is kept in Sharava Samputa and heating is done for half Prahara (1 and half hour) using Angar Agni. By doing this process Svarna becomes Purna Varna.

2. वल्मीकमृत्तिकाः धूमं गैरिकं चेष्टिकापटु ।
इत्येता मृत्तिकाः पञ्च जम्बीरैरारनालकैः ॥
पिष्ट्वा लेप्यं स्वर्णपत्रं पुटेन तु विशुद्ध्यति ।
धारयेत्स्वर्णपत्रीभिस्त्रिदिनं पञ्च मृत्तिका ॥
(Ras.Sar.Sam. 1/258-59)

Ingredients :

1. Svarna Patra		
2. Valmika Mritika	-	1 Part
3. Griha Dhoom	-	1 Part
4. Gairika	-	1 Part
5. Ishtika Churna	-	1 Part
6. Saindhava Lavana	-	1 Part
7. Jambiri/Arnala juice	-	Q.S.

Paste of ingredient from 3-6 is made with the help of Jambiri Swarasa/Aranala then it is smeared over Svarna Patra and Puta is given. By doing this process Svarna becomes Shuddha.

Marana

1. कृत्वा कण्टक वेध्यानि स्वर्णपत्राणि लेपयेत् ।
लुङ्गाम्बु भस्मसूतेन म्रियते दशभिः पुटैः ॥
(R.R.S. 5/15)

Svarna's Kantaka Vedhi Patras are smeared with paste of Parad Bhasma and Matulunga Swarasa and Puta is given. By repeating this for 10 times the Bhasma of Svarna is prepared.

2. शुद्धसूतं समं स्वर्ण खल्वे कृत्वा तु गोलकम् ।
ऊर्ध्वाधो गन्धकं दत्त्वा सर्वतुल्यं निरुध्य च ॥
त्रिंशद्धनोपलैर्दद्यात्पुटान्येवं चतुर्दश ।
निरूत्थं जायते भस्म गन्धो देयः पुनः पुनः ॥
(Ras. Sar. Sam. 1/255-56)

1. Shuddha Svarna	-	1 Part
2. Shuddha Parada	-	1 Part
3. Shuddha Gandhaka	-	3 Parts

Shuddha Svarna is added to Shuddha Parada and triturated to make a bolus. Half the quantity of Gandhaka is kept in a Sharava and Svarna Golaka is kept on it and the rest Gandhaka is kept over it. The Golaka is covered with another Sharava. Sandhi Bandhana of Sharava is done. Puta with thirty Vanopalas is given adding Gandhaka each time in 1 part and the process is repeated for 14 times.

3. शुद्ध स्वर्णभवं चूर्णं तत्समं श्वेतमल्लकम् ।
काञ्चनारद्रवैर्मर्द्यं तुलसी स्वरसैस्तथा ॥
विधाय चक्रिकां शुष्का ततो लघुपुटे पचेत् ।
द्वितीयादि पुटे देयं मल्लं पादामितं बुधैः ॥
अरूणाभं भवेद्भस्म हेम्नस्तु दशभिः पुटैः ॥
(Rasamrita 3/16-18)

1. Shuddha Svarna	-	1 Part
2. Shweta Malla	-	1 Part
3. Kanchanara Drava	-	Q.S.
4. Tulsi Swarasa	-	Q.S

Shweta Malla is added to Shuddha Svarna and triturated well with Kanchanara Kwatha for one day and Tulsi Swarasa for a day. Small thin Chakrikas are made and dried. The Chakrikas are kept in Sharava Samputa, Sandhi Lepa is done and Laghu Puta is given. The process is repeated for

10 times. The quantity of Malla is 1/4 the from 2nd puta. The colour of this Bhasma will be red.

Svarna Lavana

विशोधितं पावक भागमानं स्वर्णं तु तत्काच शराव संस्थम्।
सुराप्रदीपे विनिधाय चाथ मन्दानलेनेह पचेद्रसज्ञः ॥
शनैः शनैः सन्ततमल्पमल्पं तुर्यांशसोराम्लकमिश्रितन्तु ।
क्षिपेद्विशुद्धं लवणाम्लमाराद्यावत्सुवर्णं द्रवतामुपैति ॥
द्रुतं सुवर्णन्तु विलोक्य शुद्धं दिग्भागिकं सिन्धुभवं क्षिपेच्च।
नारङ्गरङ्गन्तु जले विशुष्के सुवर्णपूर्वं लवणं हरेद्वै ॥
(R.T. 15/35-37)

3 Part of Shuddha Svarna is taken in a glass Sharava and is heated on spirit lamp. Lavana Drava and Shorana Drava is added slowly to it till Svarna is dissolved. Now 10 parts of Saindhava Lavana is added to it and it is heated till it becomes complete dry. After complete drying the powder having colour of Narangi Varna (Orange colour) is obtained which is known as Svarna Lavana. It is kept in glass bottle and use accordingly.

Svarna Druti

मण्डूकास्थिवसाटङ्कहयलालेन्द्रहगोपकैः ।
प्रतिवापेन कनकं सुचिरं तिष्ठति द्रुतम् ॥
(R.R.S. 5/20)

Svarna Prativap in Mandook Ashthi, Vasa, Tankana, Ashwa Lara (Saliva of horse) and Indragop makes Svarna Druti for long time.

Probable Physicochemical Changes

Advanced physicochemical tests like XRD, FE-SEM, FE-TEM and Gravimetric test done on the Swarna Bhasma prepared with gold and mercury (1:2) and juice of C. Medica (Q1) were triturated to form amalgam. Then it was placed in an earthen crucible with equal quantity of Sulphur powder. It was subjected to Puta with 30 cow dung cakes. The temperature gradually reaching up to a temperature 9000C prepared Bhasma was analysed and found that XRD pattern confirm that it comprises of pure gold, FE TEM confirm that it comprises of pure gold, FE TEM confirm the presence of gold nano particles of 5-20 nm size, and Gravimetric test shot 55% Gold in Swarna Bhasma.

Importance of temperature while processing

The general purification of Svarna, it is quenched by making it red hot. Svarna is appropriate 7600C (cherry red). Whereas for making Bhasma (ash), Kukkuta Puta is required which required the highest temperature (994-8800C).

Dosage- 30-120 mg

Yoga

1. Jaymangal Rasa
2. Svarna Parpati
3. Makardwaja
4. Hemagarbha Pottali
5. Kasturi Bhairava Rasa

Research updates

Swarna Bhasma, having nano sized particles with a crystallite size of 28-35 nm having 90% pure gold as visible from XRD and elemental analysis, did not induce any blood cell aggregation or any protein adsorption. Activation potential of these preparations towards complement system or platelets was negligible. These particles were also non cytotoxic.

Research study demonstrated that uptake of gold nano particles occurred in the small intestine by absorption through single, degrading enterocyst in the process of being extruded from a villus and gold nanoparticles typically less than 58nm in size reaching various organs through blood.

Study done on cellular entry of incinerated ancient gold particles (Swarna Bhasma) and chemically synthesized gold particles shows that Incinerated Gold particles (I Au Ps) are large irregular shaped particles formed from 60 nm crystallites that are non-toxic to HELA or HFF-1 cells. It was also found that larger I Au Ps entered cells via macropinocytosis, while smaller particles entered via clathrin-dependent recaptor mediated endocytosis.

Rajata (Silver)

Synonyms

रजतं रुचिरं रौप्यं तारं सौधञ्च शुभ्रकम्।
चन्द्रलोहं चन्द्र हासं रूपकं चन्द्र संज्ञकम्॥
(R.T. 16/01)

Rajata, Ruchira, Raupya, Tara, Sandha, Shubhrakam, Chandraloha, Chandrahasa, Rupaka and all the names of Chandrama are synonyms of Rajata.

Metallic Identification

Nature	- Granular, nuggets and feather like dendrites
Colour	- Silver white, turning greyish black the due tarnishing
Streak	- White
Cleavage	- None
Fracture	- Hackly
Lustre	- Metallic
Tenacity	- Sectile, ductile and malleable
Transparency	- Opaque
Hardness	- 2.5 to 3.0
Specific Gravity	- 10.1 to 11.1
Melting point	- 961.80C

Sources

- Sahaja - Occurs in Kailash Parvata.
- Khanija - Occurs in Himalaya Parvata
- Kritrima - Vanga which was transformed into Rajata due to touching of Paduka of God Ram.

Native Rajata occurs in the earth's crust in two principal ways.

- As small amounts in the oxidised zone of ore deposits.
- As deposits from hydrothermal solutions. It occurs with sulphides zeolites, Calcite, Barite, Fluorite and quartz.

In India, there are no Rajata deposits as such. It is found associated mainly with lead and zinc and some extent with copper and gold. All galena deposits of Zawar, Rajpura-Dariba in Rajasthan. Sargipalli in Orissa, Bandalamotu and Nallakonda in Andhra pradesh. Bihar and Pauri-Garhwal in Uttaranchal in variably contain Rajata.

Ores of Rajata

1. Argentite
2. Polybasite
3. Cerargyrite
4. Pyrargyrite
5. Stephanite

Types

सहजं खनिसञ्जातं कृत्रिमं त्रिविधं मतम्।
रजतं पूर्वपूर्वं हि स्वगुणैरूत्तरोत्तरम्॥
(R.R.S. 5/22)

Rajata is of three types

1. Sahaja - Sarva Vyadhi Nashaka, Superior to all
2. Khanija - Shrestha Rasayana, Medium
3. Kritrima - Sarva Rogaghana, Kanishtha

Grahya Lakshana of Rajata

घनं स्वच्छं गुरु स्निग्धं दाहे छेदे सितं मृदु।
शङ्खाभं मसृणं स्फोटरहितं रजतं शुभम्॥
(R.R.S. 5/26)

The best Rajata is Ghana (Solid), Svachchha, Guru (Heavy) Snigdha (Smooth), remains white on cutting and heating, looks white and clear as Shankha and should not be brittle.

Agrahya Lakshana of Rajata

दाहे रक्तं च पीतं च कृष्णं रूक्षं स्फुटं लघु।
स्थूलाङ्गं कर्कशाङ्गं च रजतं त्याज्यमष्टधा॥
(R.R.S. 5/27)

The Rajata which becomes red, yellow and black on heating, which is rough, brittle, light, thick, hard on touch, with scales and mixed with other metals should not be used.

Shodhana

तैले तक्रे गवां मूत्रे ह्यारनाले कुलत्थजे।
क्रमान्निषेचयेत्तप्तं द्रावे द्रावे तु सप्तधा॥

1. Rajata - Patra - 1 Part
2. Taila (Tila) - Q.S. (For Nirvapa)
3. Takra - Q.S.
4. Gomutra - Q.S.
5. Arnala - Q.S.
6. Kulattha Kwatha - Q.S.

Rajata Patras is heated and soaked in each of the drugs (2-6) separately for seven times.

Vishesha Shodhana

1. पत्रीकृतं तु रजतं ज्वलने प्रतप्त निर्वापयेन्मुनितरोः स्वरसे त्रिवारम्॥ (R.T. 16/6)

1. Rajata - 1 Part
2. Agastya Patra Rasa - Q.S.

Rajata Patras is heated and immersed in Agastya Patra Swarasa for three times.

2. नागेन टङ्कणेनैव वापितं शुद्धिमृच्छति।
तारं त्रिवारं निक्षिप्तं तैले ज्योतिष्मतीभवे॥
(R.R.S. 5/31)

Rajata with equal parts of Naga and Tankana and then by doing Prativapa in Jyotismati Taila, it becomes Shuddha.

Marana

1. कर्षद्वयमितं तारं विशुद्धन्तु समाहरेत्।
रसेश्वरं तारतुल्यं निर्मलञ्च हरेद्भिषक्॥
खल्वे सम्पेष्य यत्नेन पिष्टिकां कारयेत्ततः।
निम्बूक स्वरसं दत्वा दिनमेकं सुपेषयेत्॥
ततः प्रक्षालयेत्कामं सलिलेन भिषग्वरः।
शुद्धं सौगन्धिकं तुल्यं तथैव नटभूषणम्॥
निक्षिप्य चाथ सम्पेष्य श्लक्षण चूर्णञ्च कारयेत्।
शराव सम्पुटे न्यस्य पुटेत्स्वल्पपुटे ततः॥
एवं पुटत्रयेणैव रजतं मृतिमाप्नुयात्।
भस्म सञ्जायते चैवं रक्तोत्पलसमप्रभम्॥
(R.T. 16/17-21)

1. Tara - 24 g
2. Shuddha Parada - 24 g
3. Nimbu Swarasa - Q.S.
4. Shuddha Gandhaka - 24 g
5. Shuddha Haratala - 24 gm

An amalgam of Rajata and Parada with Nimbu Swarasa is prepared. The Nimbu is washed away with water. Equal parts of Gandhaka is added and ground well then Haratala is added and ground well. Small thin Chakrikas are prepared. These are subjected to Kukkuta Puta for seven times and thereafter Laghuputa for three times.

2. समाहरेत्सुविमलं तारपत्रकणाच्चयम्।
निम्बूकद्रव संशुद्धं निरम्लाकृतिहिंगुलम्॥
तारद्विगुणितं दत्वा पिष्ट्वा चूर्णञ्च कारयेत्।
ऊर्ध्वपातन यन्त्रेण पचेत्पाक विधानवित्॥
भूयो भूमः पचेघावद्रजतं मृतिमाप्नुयात्।
अधःस्थं सुमृतं तारं कृष्णाभमतिसुन्दरम्॥
आहरेदूर्ध्वसंस्थन्तु रसेशञ्चाति निर्मलम्।
एवं मृतं चन्द्रलोहं तत्वाद्योगेषु योजयेत्॥
(R.T. 16/37-40)

1. Tara Patra Kana - 1 Part
2. Hingula Shuddha - 2 Parts
3. Nimbu Swarasa - Q.S.

The Shodhita Hingula (Processed in Nimbu Swarasa) is to be washed with water and mixed with particles of Rajata and ground well. This is to be kept in Urdhva Patana Yantra and heated for 6 hours when cooled the pot is opened and Parada from the upper vessel and Rajata from the lower vessel are collected. This process is repeated till the formation of proper Bhasma.

Rajata Druti

सप्तधा नरमूत्रेण भावयेद्देवदालिकाम्।
तच्चूर्णवापमात्रेण द्रुतिः स्यात्स्वर्णतारयोः॥
(R.R.S. 5/41)

Devadali Churna is Bhavita for seven times with human urine. Then this Churna is added to melted Rajata make it into liquid form.

Probable Physicochemical Changes

Rajat Bhasma prepared with Kajjali followed

by Bhavana of Kumari Swarasa (the total number of Puta given 17) shows the following physicochemical values-

Physicochemical parameter	Value
pH	7.34
Ash value	98.32
Acid insoluble ash	9.32
Water soluble ash	0.10
Loss on Drying (at 1100C)	0.54
% Ag	81.77
% S	13.15

Importance of temperature while processing-

To heat the Rajata, a temperature of approximately 6500C is required. Therefore, while purifying by the Nirvapa Method, such a heating device should be used. So this that the above temperature can be provided. There is mention of Kukkuta Puta or Lagu Puta for making Rajata Bhasma in classics. The highest temperature of this Puta is around 7000C.

Dosage- 30 to 60 mg

Yoga

1. Brihat Kasturi Bhairava Rasa
2. Jaymangala Rasa
3. Brihat Vata Chintamani Rasa
4. Rajamriganka Rasa
5. Rasaraja Rasa

Research updates

In their study done on Rajat Bhasma and silver nanoparticle by Sharma R. et al. the average particle size of Rajat Bhasma was in the range of 10-60 nm while ICP-AES analysis shows 76%-90% silver content. Anti-bacterial activity of Rajat Bhasma (500 mg) and synthesized Nano particle (500 mg) at the present concentration was evident only against S. aureus.

Study done by Kar Pallab et al on the Rajat Bhasma shows nano particles were spherical and cubical in shape while EDX analysis shows that 80.00% Ag in case of nano particle synthesized from C. inerme and 37.30% in Rajat Bhasma nano particle.

Tamra (Copper)

Synonyms

ताम्रं शुल्वं रक्तकं म्लेच्छवक्त्रं नेपालीयं त्रयम्बकं सूर्यलोहम्।
त्वाष्ट्रं त्वकं सूर्यपर्यायसंज्ञ द्विष्टं द्वयष्टं त्वम्बकं कीर्तितं तत्॥
उदुम्बरञ्चारविन्दं सूर्याङ्गं लोहितायसम्।
रविप्रियं भास्करं च ताम्रकं च प्रकीर्तितम्॥
(R.T. 17/1-2)

Tamra, Shulva, Raktak, Malechhavaktra, Nepaliya, Trayambaka, Suryaloha, Twarshtra, Twak, all the names of Surya, Dwishta, Dwyashta, Trambaka, Udumbara, Arvind, Suryanga, Lohitayas, Ravipriya and Tamraka are the synonyms of Tamra.

Metallic Identification

Nature	-	Plates, wires or rods can be bent by hand
Colour	-	Copper red
Streak	-	Copper red
Cleavage	-	None
Fracture	-	Hackly
Lustre	-	Metallic
Tenacity	-	Malleable
Transparency	-	Opaque
Hardness	-	2.5 to 3.0
Specific Gravity-		8 to 9
Melting point	-	10850C

Sources

शुक्रं यत्कार्तिकेयस्य पतितं धरणीतले।
तस्मात्ताम्रं समुत्पन्नमिदमाहुः पुराविदः॥
(A.P. 3/110)

Virya of God Kartikeya which fall on earth that become Tamra. Tamra in native form, occurs as irregular platy dendrites, crystals and compact mass and is most comm-only associated with basic extrusive igneous rocks. Such occurrences are very limited. Copper ore occurs in abundance at Khetri in Rajasthan and Maubhandara, Ghat Sheela in Jharkhand.

Important ores-

1. Chalcocite Cu_2S
2. Copper pyrite $CuFeS_2$
3. Azurite 2 $CuCO_3$ $Cu(OH)_2$
4. Cuprite Cu_2O
5. Melekite $CuCO_3$ $Cu(OH)_2$

Copper is also available in Bhonaga and Mayurpichchha.

Types

म्लेच्छं नेपालकं चेति तयोर्नेपालकं वरम्।
(R.R.S. 5/42)

Tamra is of two types :

1. Nepali - It is uperior
2. Mlechchcha

Grahya Lakshana of Tamra

सुस्निग्धं मृदुलं शोणं घनाघातक्षमं गुरू।
निर्विकारं गुण श्रेष्ठं ताम्रं नेपालमुच्यते॥
(R.R.S. 5/44)

The Tamra which is Snigdha (Smooth), Mridu (Soft), Shona (Deep red) Ghanaghata Kshama (Bear hard impact and do not break), Guru (Heavy) Nirvikar (Free from impurities) is superior and Nepali Tamra.

Agrahya Lakshana of Tamra

सिताकृष्णारूणच्छायमतिवामि कङ्कोरकम्।
क्षालितं च पुनः कृष्णमेतन्म्लेछकताम्रकम्॥
(R.R.S. 5/43)

The Tamra which is blackish red, Sita in colour, causes vomiting, very hard, remains black even after washing is Mlechcha Tamra and it is considered inferior and not taken for use.

पाण्डुरं कृष्ण शोणं च लघुस्फुटन संयुतम्।
रूक्षाङ्गं सदलं ताम्र नेष्यते रस कर्मणि॥
(R.R.S. 5/45)

Which is pale, blackish red in colour, light weight, brittle, associated with scale and breakable is not good for Rasa Karma.

Ashta Dosha of Tamra

न विषं विषमित्याहुस्ताम्रं तु विषमुच्यते।
एको दोषो विषे ताम्रे त्वष्टौ दोषाः प्रकीर्तिताः॥
(A.P. 3/115)

Tamra is said to be more poisonous than poison because poison has only one Dosha but Tamra has eight Doshas.

भ्रमो मूर्च्छा विदाहश्च स्वेदक्लेदनवान्तयः।
अरुचिश्चित्तसंताप एते दोषा विषोपमाः॥
(A.P. 3/116)

1. Bhrama (Vertigo)
2. Murchchha (Syncope)
3. Vidaha (Burning sensation)
4. Sveda (Sweating)
5. Kledana (Wetness sensation)
6. Vantya (Vomiting)
7. Aruchi (Tastelessness)
8. Chitta Santapa (Mental illness)

Shodhana

तैले तक्रे गवां मूत्रे ह्यारनाले कुलत्थजे।
क्रमान्निषेचयेत्तप्तं द्रावे द्रावे तु सप्तधा॥

1. Tamra Patra
2. Tila Taila
3. Takra
4. Gomutra
5. Aranal
6. Kulattha Kwatha

The Tamra Patras are heated and immersed for seven times in each of the drugs one after the other.

Vishesha Shodhana

1. स्नुह्यर्कक्षीरसिन्धूत्थैस्ताम्रपत्राणि लेपयेत्।
अग्नौ प्रताप्य निर्गुण्डीरसे संसेचयोत्त्रिशः॥
स्नुह्यर्कक्षीरसेकैर्वा शुल्वशुद्धिः प्रजायते॥
(A.P. 3/118-1181/2)

1. Tamra Patra
2. Snuhi Ksheera
3. Arka Ksheera
4. Saindhava Lavana
5. Nirgundi Swarasa

Saindhava is mixed with Snuhi Ksheera and Arka Ksheera to make paste which is smeared on Tamra Patra and kept for drying. Thereafter Tamra Patra is heated and immersed in Nirgundi Rasa. This process is repeated for three times.

Another process is that Tamra Patra is heated and while on the Snuhi and Arka Ksheer are dropped over it in small quantities and allowed to evaporate.

2. गोमूत्रेण पचेद्यामं ताम्र पत्रं दृढाग्निना।
शुद्ध्यते नात्र सन्देहो मारणं चाप्यथोच्यते॥
(R.R.S. 5/52)

Tamra Patra are kept in Gomutra and heated for one Yama. It become Shuddha and ready for Marana process.

Marana

1. जम्बीर रस सम्पिष्ट रसगन्धकलेपितम्।
शुल्वपत्रं शरावस्थं त्रिपुटैर्याति पञ्चताम्॥
(R.R.S. 5/53)

Kajjali is made in paste form with help of Jambiri Swarasa and smeared over Tamra Patra and Puta is given. The process is repeated for three times then Puta is prepared.

2. सूक्ष्माणि ताम्रपत्राणि कृत्वा संस्वेदयेद् बुधः।
वासरत्रयमम्लेन ततः खल्वे विनिक्षिपेत्॥
पादांश सूतकं दत्वा याममम्लेन मर्दयेत्।
तत् उद्धृत्य पत्राणि लेपयेद्विगुणेन च॥
गन्धकेनाम्लधृष्टेन तस्य कुर्याच्च गोलकम्।
ततः पिष्ट्वा च मीनाक्षी चांगेरी व पुनर्नवाम्॥
तत्कल्केन बर्हिर्गोलं लेपयेदंगुलोन्मितम्।
धृत्वा तद्गोलकं भाण्डे शरावेण च रोधयेत्॥
बालुकाभिः प्रपूर्याथ विभूतिलवणाम्बुभिः।
दत्वा भाण्डमुखे मुद्रां ततश्चुल्लयां विपाचयेत्॥
क्रमवृद्धाग्निना सम्यग्यावद्यामचतुष्टयम्।
स्वाङ्गशीतलमुद्धृत्य मर्दयेत्सूरणद्रवैः॥
दिनैकं गोलकं कुर्यादर्धगन्धेन लेपयेत्।
सधृतेन ततो मूषां पुटे गजपुटे पचेत्॥
स्वांगशीतं समुद्धृत्यं मृतं ताम्र शुभं भवेत॥
(Sha.Mad. 4/28-341/2)

1. Tamra Patra - 1 Part
2. Nimbu Rasa - Q.S.
3. Shuddha Parada - 1/4 Part
4. Shuddha Gandhaka - 2 Parts
5. Meenakshai/Changeri/Punarnava - Q.S.
6. Rakta Punarnava - Q.S.
7. Shuddha Gandhaka - 1/2 Part
8. Go Ghrita - Q.S.

The thin Patras of Shodhita Tamra are boiled in Nimbu Rasa for three days. One fourth quantity of Parada by weight is mixed with Tamra Patra and ground well for three hours adding Nimbu Rasa. Gandhaka twice the quantity of Tamra Patra is ground with Nimbu rasa and made into a bolus (Golaka). To this Golaka, Kalka of Meenakshi, Changeri or Punarnava is applied. The thickness of Lepa should be 3.75 cm. This dried and the Golaka is kept at the bottom of a Bhanda. This is covered by a Sharava and Sandhi is sealed with clay smeared cloth. The remaining upper portion of the pot is filled with sand. The mouth of the pot is covered with Sharava and Sandhi is sealed. This pot is then placed on a over and heated with Kramavriddhi Agni for 12 hours. When cooled the Golaka is to be removed from the pot. This is ground with the juice of Surana kanda for one day. Gandhaka with little ghee is pasted over it and placed in a Sharava samputa and after Sandhi Lepa is put to Gajaputa for three times.

Amritikarana of Tamra Bhasma

1. सम्यङ्मृतं सूर्यसखस्य चूर्णं तदर्धसंशोधितगन्धकञ्च।
दत्वा ततोऽम्ले खलु निम्बुकोत्थैः सम्पेषयेद् याममलं रसज्ञः॥
गोलं विधायाऽथ रविप्रियस्य ह्युपर्यधः सूरणकन्दसंस्थम्।
मृतकर्पटैश्चाथ विलिप्य गोलं पुटे गजाख्ये पुटयेद्विधिज्ञः॥
(R.T. 17/40-41)

1. Tamra Bhasma - 1 Part
2. Shuddha Gandhaka - 1/2 Part
3. Nimbu Rasa - Q.S.
4. Surana Kanda -

Gandhaka is added to Tamra Bhasma and triturated well with Nimbu Rasa for 3 hours. This is to be made into a bolus and placed into a Surana Kanda scooped in the middle to accommodate the bolus. The upper portion is covered with part of Surana Kanda and wrapped with clay smeared cloth and is dried. This is subjected to a Gajaputa when cooled the ashes removed and it is powdered and preserved.

2. सुमृतं ताम्रचूर्णन्तु तदर्ध गन्धकं तथा।
पञ्चामृतेन सम्पेष्य विधानज्ञा भिषग्वरः॥
शराव सम्पुटे न्यस्य ताम्रं विहित चक्रिकम्।
त्रिवारं पुटयेदेवं रस तन्त्र विचक्षणः॥
(R.T. 17/37-38)

1. Tamra Bhasma - 1 Part
2. Shuddha Gandhaka - 1/2 part
3. Panchamrita - Q.S.

Tamra Bhasma is mixed with Gandhaka and ground well with help of Panchamrita and Chakrikas are made and dried. It is kept into Sharava and Samputa is done and Puta is given the process is repeated for three times.

Probable Physicochemical Changes

In their study done by M.P. Wadekar et.al on Tamra Bhasma was analysed on various modern tool and it was found that surface state of Tamra Bhasma as compared to standard was identified as CuO in XPS analysis while XRD also suggests Tamra Bhasma is composed of cupric oxide. The elemental composition of the drug sample analysed by EDX shows 60% copper present in 'Tamra Bhasma' was equivalent to 75% CuO (as per the stoichiometry).

In their study done on Tamra Bhasma by Dahikar et al. analytical study of Tamra Bhasma pH 6.76, loss on drying 1.14%, acid insoluble ash 1.12% were found respectively.

Effect of temperature while processing. Heating copper in the air can produce two different reactions depending on how hot it gets-oxidation at a temperature below 9800C and decomposition of carbon monoxide at higher temperature above 980C.

Yoga

1. Aarogya Vardhini Vati
2. Hridayarnava Rasa
3. Tamra Parpati
4. Panchamrita Parpati
5. Nityanand Rasa

Research updates

Toxicity study done by Jagtap et.al on Tamra Bhasma prepared from Ashodhita and Shodhita Tamra in rats show that Tamra Bhasma prepared from Ashodhita Tamra has pathological implications on different haematological, serum biochemical and cyto architecture of different organ even at therapeutic dose level (5.5 mg/ug). While Tamra Bhasma prepared from Shodhita Tamra is safe even at five fold to therapeutic equivalent does (27.5 mg/kg).

Loha (Iron)

Iron is not just taken as dietary supplement in Ayurveda it is also used in various forms, such as herbal preparations and minerals.

Synonyms

Loha, Ayasa, Shastrala, Tikshnaka, Kalayasa etc.

Metallic Identification	-	Kanta Lauha
Nature	-	Lump
Colour	-	Greyish black
Streak	-	Reddish black
Cleavage	-	None
Fracture	-	Uneven
Lustre	-	Metallic
Tenacity	-	Brittle
Transparency	-	Opaque
Magnetism	-	Magnetic in nature
Hardness	-	5.5 to 6.0
Specific Gravity	-	5 to 6

Sources

Kanta Lauha occurs in igneous as well as metamorphic rocks as accessory mineral. It is a wide spread oxide mineral found in earth's crust in are form. Kanta Lauha is commonly associated with hematite (Fe2O3).

In India Kanta Lauha occurs mainly in Andhra Pradesh, Tamil Nadu. Karnataka, Himachal Pradesh, Orissa and Jharkhand.

Ores of Iron

1. Gairika-Fe_2O_3
2. Magnetite-Fe_2O_4
3. Raupya Makshika-Fe_2S_3
4. Limonite-$2Fe_2O_3.3H_2O$
5. Siderite-$FeCO_3$
6. Svarna Makshika-$CuFeS_2$

Types of Loha

मुण्डं तीक्ष्णञ्च कान्तञ्च त्रिप्रकारमयः स्मृतम् ।
(R.R.S. 5/69)

Lauha is of three types-

1. Munda Lauha
2. Tikshana Lauha
3. Kanta Lauha

Munda Lauha

मुण्डं तथा मुण्डलौहं कृषि लोहं शिलात्मजम् ।
कृष्णायसं हृषत्सारमायसञ्च निगधते ॥
(R.T. 20/2)

Munda, Munda Lauha, Krishi Loha, Shilatmaja, Krishnayas, Hrishtsara and Ayas are synonym to Munda Lauha.

Tikshna Lauha

लोहो लौहं लोहकञ्च शस्त्रलोहञ्च तीक्ष्णकम् ।
सारलोहं काललोहंत्वयश्चदिहोच्यते ॥
(R.T. 20/3)

Loha, Lauha, Lohaka, Shastra Loha, Tikshanaka, Sara Loha, Kala Loha are synonyms to Tikshna Lauha.

Kanta Lauha

कान्तलोहं तथा कान्तं त्वयस्कान्तञ्च तन्मतम् ।
कान्तायसं महालोह तदेव विनिगद्यते ॥
(R.T. 20/4)

Kanta Lauha, Kanta, Ayaskanta, Kantayas and Maha Loha are synonyms to Kanta Lauha.

Note- Munda Lauha is known as Cast iron or Pig iron. Tikshana Lauha is wrought iron and Kanta Loha is magnetic iron or magnetite.

Pig Iron- The iron that comes out from the blast furnace is known as Pig iron.

It has more impurities and contains upto 4-5%. Carbon, 1.7%, Maganese, 0.37. Phosphorous, 0.04% Sulphur and 1% Silicon. Pig iron contains iron carbide which makes it brittle.

Cast Iron- Molded pig iron is known as cast iron and it is alloy of iron and carbon. It contains 3 to 3.5% carbon and is less brittle than pig iron.

Wrought Iron- It is alloy of Carbon and Iron in which carbon is less than 0.08%. This type of iron contains fibrous slag 2% by weight which makes it granular structure. This can be seen on breaking.

Steel- It is also an alloy of iron and carbon in which carbon is 2.14% by weight. Sometimes it also contains Chromium and Nickel.

Magnetite- It is a mineral having formula Fe_3O_4 and it has magnetic property.

Types of Munda, Tikshana and Kanta Lauha

मृदु कुण्ठं कडारञ्च त्रिविधं मुण्डमुच्यते ॥

खरं सारञ्च हृन्नालं तारावट्टञ्च वाजिरम्।
काललोहाभिधानञ्च षड्विधं तीक्ष्णमुच्यते॥
भ्रामकञ्चुम्बकञ्चैव कर्षकं द्रावकं तथा।
एवञ्चतुर्विधं कतं रोमकान्तञ्च पञ्चमम्॥
(R.R.S. 5/69-71)

It can be summarised as follows-

Sr. No.	Munda Lauha	Tikshana Lauha	Kanta Lauha
1.	Mridu	Khara	Bhramaka
2.	Kuntha	Saara	Chumbaka
3.	Kadar	Hrinnal	Karshaka
4.	-	Taravatta	Dravaka
5.	-	Vajira	Romkanta
6.	-	Kala loha	-

Grahya and Agrahyata Lakshana of Loha

1. Munda loha : It is of three types. Their properties are as follows :

Mridu Munda-

द्रुतद्रावमविस्फोटं चिक्कणं मृदु तच्छुभम्॥
(R.R.S. 5/72)

It melts quickly, smooth, soft on touch. It is superior amongst all Munda Loha.

Kuntha-

हतं यत्प्रसरेद्दुःखान्तत्कुण्ठं मध्यमं स्मृतम्।
(R.R.S. 5/73)

Which does not expound easily that is Kuntha variety. It is medium.

Kadar-

यद्धतं भज्यते भङ्गे कृष्णं स्यात्तत्कडारकम्॥
(R.R.S. 5/73)

Which breaks easily and usually black colour on the edges.

2. Tikshana Loha- It is of six types. Their descriptions are as follows :

Khara-

पह्लवं पोगरोन्मुक्तं भङ्गे पारदवच्छवि।
नमने भङ्गुरं यत्तत्खरलोहमुदाहृतम्॥
(R.R.S. 5/77)

Loha which is rough, free from Pogara, on breaking looks like white as Parada, brittle on bending is known as Khara Loha.

Sara-

वेगभङ्गुरधारं यत्सारलोहं तदीरितम्।
पोगराभासकं पाण्डुभूमिजं सारमुच्यते॥
(R.R.S. 5/78)

It breaks on impact into small pieces and Pogara can not be seen and obtained from pale coloured soil.

Hrinnala-

कृष्णपाण्डुवपुश्चञ्चुबीज तुल्योरुपोगरम्।
छेदने चातिपरूषं हृन्नालमिति कथ्यते॥
(R.R.S. 5/79)

Loha which is Krishna Pandu Varna (Black pale colour), Pogar, similar to Eranda seed, is present, which is very hard in cutting is Hrinnala variety of Loha.

Vajira-

योगरैर्वज्रसङ्काशैः सूक्ष्मरेखैश्च सान्द्रकैः।
निचितं श्यामलाङ्गञ्च वाजीरं तत्प्रकीर्त्यते॥
(R.R.S. 5/81)

Loha which have Pogar like diamond with small and dense lines having lusture and Shyam Varna that is Vajira.

Kalaloha-

नील कृष्णप्रभं सान्द्रं मसृणं गुरूभासुरम्।
लोहाघातेऽप्यभङ्गात्मधारं कालयसंमतम्॥
(R.R.S. 5/82)

Which is bluish black colour, dense, smooth heavy and shiny and does not breaks on impact that is Kalaloha.

चिकुरं भंगुरं लोहात पोगरं तत्परं स्मृतम्॥
(R.R.S. 5/80)

Tikshna loha in which Pogar looks like hair (Roma/Kesh) that is of Taravatta variety.

Pogar

अङ्गं छाया च वङ्गञ्च पोगरस्याभिधात्रयम्।
चिकुरं भङ्गुरं लोहात्पोगरं तत्परं स्मृतम्॥
(R.R.S. 5/80)

Anga, Chhaya and Vanga these three are synonyms of Pogar. On breaking Loha the fibrous structure visible on edge is known as Pogar.

Superiority

श्रेष्ठता- खरलोहात्परं सर्वमेकैकस्माच्छतोत्तरम् ॥
(R.R.S. 5/83)

Khara, Sara, Hrinnal, Taravatta, Vajira and Kalaloha are superior as hundred times Uttarotara.

Kanta Loha

भ्रामकं चुम्बकञ्चैव कर्षकं द्रावकं तथा।
एवं चतुर्विधं कान्तं रोमकान्तञ्च पञ्चमम् ॥
(R.R.S. 5/85)

Bharamaka, Chumbaka, Karshaka, Dravaka and Romakanta these five are the variety of Kanta Loha. This division is based on the power of magnetism present in it.

Types on the basis of Mukha and Varna

एकद्वित्रिचतुष्यपञ्चसर्वतो मुखमेव तत्।
पीतं कृष्णं तथा रक्तं त्रिवर्णे स्यात्पृथक् पृथक् ॥
(R.R.S. 5/86)

All the five types of Kanta Loha are having 1, 2, 3, 4 or Sarva Mukha i.e. each type is five types. On the basis of colour each type is of three types i.e. Pita. Rakta and Krishna Varna.

Pita Varna is Sparsh Vedhi, Krishna Varna is superior, Rasayana while Rakta Varna is used in Rasa Bandha.

Grahya Lakshana of Tikshana Loha

कासीसामलकल्कास्ते लोहेऽङ्गं दृश्यते स्फुटस।
तीक्ष्णलोहं तदुदिष्टं मारणायोत्तमं विदुः ॥
(A.P. 3/214)

If one can see image of himself in the Tikshana Loha after washing it with the paste of Kasisa and Amalaki then this Tikshana Loha is accepted for Marana process.

Grahya Lakshana of Kanta Loha

पात्रे यस्य प्रसरति जले तैलबिन्दुर्न लिप्तो, गन्धं हिङ्गु त्यजति च तथा तिक्ततां निम्बकल्कः ॥
पाके दुग्धं भवति शिखराकारकं नैति भूमौ, कान्तं लौहं तदिदमुदितं लक्षणोक्तं च नान्यत् ॥ (R.R.S. 5/95)

1. Kanta Loha vessel is filled with water and drop of oil is added to it then this drop of oil does not expanded.
2. By placing Hingu into it Hingu loose its specific smell.
3. By placing Nimba Kalka its bitterness ends.
4. When milk is boiled it does not comes out from vessel.

Dosha of Loha

गुह्वता दृढतोत्क्लेदः कश्मलं दाहकारिता।
अश्मदोषः सदुर्गन्धो दोषाः सप्तायसः स्मृताः ॥
(A.P. 3/223)

1. Guruta (Heavyness)
2. Dridhata (Stiffness)
3. Utkleda (Nausea)
4. Kashmal (Glani)
5. Daha (Burning sensation)
6. Ashmari (Stone)
7. Durgandhata (Bad smell). These seven are Loha dosha.

Shodhana

Samanaya Shodhana :

तैले तक्रे गवां मूत्रे ह्यारनाले कुलत्थजे।
क्रमान्निषेचयेत्तप्तं द्रावे द्रावे तु सप्तधा ॥

1. Loha Churna	-	1 Part
2. Tila Taila	-	Q.S.
3. Takra	-	Q.S.
4. Gomutra	-	Q.S.
5. Arnala	-	Q.S.
6. Kulattha Kwatha	-	Q.S.

Loha Churna are heated and immersed in each liquid for seven times separately.

Vishesha Shodhana

1. क्वाथ्यमष्टगुणे तोये त्रिफलाषोडशं पलम्।
तत्क्वाथे पादशेषे तु लोहस्य पलपञ्चकम् ॥
कृत्वा पत्राणि तप्तानि सप्तवारं निषेचयेत्।

एवं प्रलीयते दोषो गिरिजो लोहसम्भवः ॥
(R.R.S. 5/102-03)

1. Loha Patra - 5 Pala
2. Triphala Kwatha - 32 Pala

Loha Patras are heated and immersed into Triphala Kwatha for seven times makes it free from Giri dosha.

For this purpose 16 Pala Triphala is taken and it is boiled into eight times of water (128 Pala) and reduced to one fourth (32 Pala) then it is used for Shodhana process.

2. सामुद्रलवणोपेतं तप्तं निर्वापितं खलु।
त्रिफलाक्वथिते नूनं गिरिदोषमयस्त्यजेत् ॥
(R.R.S. 5/104)

Loha Patras are kept in solution of Samudra Lavana and then heated up to red hot and now these are dipped into Triphala Kwatha the process is repeated for seven times.

3. शशक्षतजसंलिप्तं त्रिवारं परितापितम्।
मुण्डादिसकलं लोहं सर्वदोषान्विमुञ्चति ॥
(R.R.S. 5/101)

Mundadi Loha are given Bhavana of Rabbit blood and then these are heated the process is repeated for three times.

Marana Matra

तस्मात्सर्वप्रयत्नेन शुद्धं लोहं च मारयेत्।
नायः पचेत्पञ्चपलादर्वागूर्ध्वं त्रयोदशात् ॥
(R.R.S. 5/97)

The quantity of Loha taken for Marana should be between 5 Pala to 13 Pala.

Marana

1. तीक्ष्णलौहस्य पत्राणि निर्दलानि दृढेऽनले।
ध्मात्वा क्षिपेज्जले सद्यः पाषाणोलूखलोदरे ॥
खण्डयेद्दृढनिर्घातैः स्थूलया लोहपारया।
तन्मध्यात्स्थूलखण्डानि रुद्ध्वा मल्लद्वयान्तरे ॥
ध्यात्वा क्षिप्त्वा जले सम्यक् पूर्ववत्कण्डयेत्खलु।
तच्चूर्णं सूतगन्धाभ्यां पुटेद्विंशतिवारकम् ॥
पुटे पुटे विधातव्यं पेषणं दृढवत्तरम्।
एवं भस्मीकृतं लौहं तत्तद्रोगेषु योजयेत् ॥
(R.R.S. 5/109-112)

Tikshana Lauha Patra are heated and then quenched into water kept into stone mortar. It is taken out and made into powder form by pounding. If any big piece is present then same process is repeated. Now this Lauha Churna is mixed with Kajjali and Puta is given. The Puta process is repeated for twenty times. In each Puta Mardana should be done strongly, Bhasma prepared by this process should be used in different diseases.

2. हिङ्गुलस्यपलान् पञ्च नारीस्तन्येन पेषयेत्।
तेन लोहस्य पत्राणि लेपयेत्पलपञ्चकम् ॥
रुद्ध्वा गजपुटे पच्यात्कषायैस्त्रैफलैः पुनः।
जम्बीरैरारनालैर्वा विंशत्यंशेन हिङ्गुलम् ॥
पिष्ट्वा रुद्ध्वा पचेल्लोहं तद्द्रवैः पाचयेत्पुनः।
चत्वारिंशत्पुटैरेवं कान्तं तीक्ष्णं च मुण्डकम् ॥
म्रियते नात्र सन्देहो दत्त्वा दत्त्वैव हिङ्गुलम् ॥
(R.R.S. 5/113-15)

1. Shuddha Hingula - 5 Pala
2. Loha Patra - 5 Pala
3. Jambira Rasa/Arnala - Q.S.
4. Nari Dugdha - Q.S.
5. Triphala Kwatha - Q.S.

Five Pala of Hingula is levigated with Nari Dugdha and then it is smeared over Loha Patra. After drying it is subjected to Gaja Puta. After self-cooling the obtained Loha is mixed with one Tola of Hingula and levigated with Triphala Kwatha and Jambiri Rasa and Puta is given and the process in repeated for forty time. By this method the Bhasma of Kanta. Tikshna and Munda Loha can be prepared.

3. गोमूत्रैस्त्रिफला क्वाथ्या तत्कषायेण भावयेत्।
त्रिःसप्ताहं प्रयत्नेन दिनैकं मर्दयेत्पुनः ॥
रुद्ध्वा गजपुटे पच्याद्दिनं क्वाथेन मर्दयेत्।
दिवा मर्द्यं पुटेद्रात्रावेकविंशद्दिनावधि ॥
एकविंशत्पुटैरेवं म्रियते त्रिविधं ह्ययः ॥
(R.R.S. 5/125-26)

Triphala Kwatha is prepared by taking Triphala and Gomutra. 21 Bhavana is given to Loha Patra by using this Gomutra. Then it is subjected to Gaja puta. This process is repeated for twenty-one times.

By this process the Bhasma of all three types of Lauha is prepared.

Trividha Loha Paka

प्रथमं भानुपाकेन स्थालीपाकात्ततः परम्।
पुटपाकेन पकञ्च लौहं सुमृतिमाप्नुयात्॥
(R.T. 20/20)

Three types of Paka to prepare the Loha Bhasma is done. By this method Loha Bhasma is prepared definitely. These three types of Paka are as follows-

1. Bhanu Paka
2. Sthali Paka
3. Puta Paka

1. Bhanu Paka

वराक्वाथ युतं लौहं भानौः प्रखर भानुभिः।
शुष्यन् विपच्यते यस्माद् भानुपाकस्ततः स्मृतः॥
(R.T. 20/21)

In a vessel Triphala Kwatha is taken and Loha is dipped into it. Now it is kept in strong sun rays for drying. This process is known as Bhanupaka.

Method

विमलं खलु लौहन्तु सलिलक्षालितं भिषक्।
त्रिफला क्वाथ संयुक्तं ततः खल्वे निधापयेत्॥
निदाधे तु निधायाथ भानोः प्रखरभानुभिः।
शोषयेद्भिषजां वर्यः कुर्यादेवं तु सप्तधा॥
(R.T. 20/22-23)

Shuddha Loha Churna is washed well with water. Then it is kept in a Khalva and Triphala Kwatha is added to it. Now it is kept in sun rays of summer season, when Triphala Kwatha is dried then fresh Kwatha is added to it. This process is repeated for seven times.

Procedure for Kwatha preparation

भानुपाके लौहतुल्या त्रिफला द्विगुणं जलम्।
पादावशोषितञ्चाभ वराक्वाथं प्रयोजयेत्॥
(R.T. 20/24)

Triphala equal to quantity of Loha is taken and two times of water is added and heated till one fourth remains. It is used for Bhanupaka.

2. Sthali Paka

त्रिफलाक्वथितोपेतं लौहं स्थाल्यां खराग्निना।
शुष्यन विपच्यते यस्मात् स्थालीपाकस्ततः स्मृतः॥
(R.T. 20/25)

Triphala Kwatha and Loha are taken is a vessel then it is dried over strong heat. This is known as Sthali Paka.

Method

भानुपाक विपक्वन्तु लोहं प्रक्षालयेदलम्।
ततः स्थाल्यां तु विन्यस्य चुल्लिकायां निधापयेत्॥
वराक्वाथेन सुपचेदतिबेलं खराग्निना।
शोषयेत्सलिलं यत्नात् लौहकर्मविचक्षणः॥
(R.T. 20/26-27)

The Loha obtained after Bhanupaka is washed and then it is kept in an earthen vessel and Triphala Kwatha is filled into this. Now it is subjected to strong heating using Chullika for drying of Kwatha. This method is known as Sthali Paka.

Triphala Kwatha preparation method

स्थालीपाके त्रिगुणिता वरा, षोडाशिकं जलम्।
अष्ट भागावशिष्टञ्च क्वाथमानं विधीयते॥
(R.T. 20/28)

Triphala is taken three times to the quantity of Loha and sixteen times water is taken then it is heated till it remains one eighth. This Kwatha is used for Sthali Paka.

3. Puta Paka

रसादिभिर्भेषजानां खल्वे लौहं विमर्दितम्।
पुटस्थं पच्यते यस्मात् पुटपाकस्ततः स्मृतः॥
(R.T. 20/31)

Loha Churna is Bhavita by using Swarasa/ Kwatha of herbs and then subjected to Puta. It is known as Puta Paka.

Method

स्थालीपाक विपक्वन्तु लौहं प्रक्षालयेत्ततः।
यथादोषौषधोत्थेन रसेन क्वथितेन वा॥
लोहखल्वे सुसम्पेष्य चक्रिकाः कारयेत्ततः।
आतपे खलु संशोष्यमृच्छरावे तु विन्यसेत्॥
शरावेण विधायाथ दृढ़सन्धिं प्रलेपयेत्।
वनानीतैः करीषैर्वा ह्युत्पलैर्हस्तपिण्डिवैः॥

पुटेद् गजपुटेनेह पुटपाक क्रिया पटुः ।
स्वाङ्गशीतं ततो ज्ञात्वा सम्पुटन्तु समाहरेत् ॥
पुनः पूर्ववदेवेह दत्त्वा क्वाथोदकं पुनः ।
सम्पेष्य सम्पुटे कृत्वा पुटेत्पुटविधानवित् ॥
(R.T. 20/33-36)

1. Loha obtained from Sthali Paka -1 Part
2. Triphala - 1 Part
3. Water for decoction - 2 Parts
   Reduced to - 1/4 Parts of water

Loha Churna processed with Sthali Paka is washed with water and mixed with Triphala Kwatha and ground well. Thin flat Chakrikas are prepared, dried and placed in Sharava Samputa. The Sandhi is sealed, dried and subjected to Gaja puta. The process is repeated for sixty times.

Probable Physicochemical Changes-

- The colour of Loha Bhasma is purple (Pakwa Jambuphala was obtained in their study done by Sarkar P.K et al.
- While Ash value 98.24%, water soluble 1-56% and Acid sohbu 99.44% was found in their study done by M.L Rajendra Prasad et al.
- Fe2O3 was found in the XRD study of Lauha Bhasma.

Importance of temperature while processing- Nirvapa Vidhi is generally used for Shodhana of Loha. In this Loha is heated and then quenched in various furnaces. For which a temperature of approximately 7500C is required. The temperature of the Gaja Puta used for Marans of Loha is in the range of 8000C-10000C.

Dosage-1/4 - 2 Ratti (31.25 mg to 250 mg)

Yoga

Munda Loha	Tikshana Loha	Kanta Loha
Mehabaddha Rasa	Tikshana mukha Rasa	Trialokya Chintamani
Pittarshahara Rasa	Pittarshahara Rasa	Vadvanala Rasa
Pitta rogantaka Rasa	Sarvaarogya Vati	Meha shatru Rasa
Madebhasingha Rasa	Raksha Rasa	Kasisbaddha Rasa
	Pittarogantaka Rasa	Mahavidya Vati

Research updates

Study done by Sarkar, et al. on hematinic evaluation of Lauha and Mandura Bhasma on HgCl2-induced Anaemia in rats show that both the Bhasma possess significant ($P<0.05$) hematinic and cytoprotective activity.

Safety and toxicity study done on Tamra Bhasma, Lauha Bhasma and Yashada Bhasma by Prajapati P.K. et al reveal no serious deleterious effects of these Bhasmas on the body function as a whole.

Study done by Tiwari M.K. et al, the detailed Rietveld analysis of the measured XRD spectrum indicates that the pharmaceutical grade Fe Bhasma is primarily composed of the Fe3O4 magnetite phase.

Mandura (rustiron)

Mandura is the rust of the iron (latin: Rubrum) with chemical formula Fe2O3.Rust is general term used for red oxides, formed by the reaction of iron and oxygen in the presence of water or air moisture.

Synonyms

मण्डूरं तु समाख्यातं किट्ट लोहभवं तथा ।
लोहकिट्टं लोहमलं लोहोच्छिष्टञ्च तन्मतम् ॥
(R.T. 20/124)

Mandura, Kitta, Lohabhava, Lohakitta, Lohamala and Lohochchhista are synonyms to it.

Physical properties

Nature	-	Black lumpy masses
Colour	-	Black
Streak	-	Black
Cleavage	-	None
Fracture	-	Conchoidal
Tenacity	-	Brittle but hard
Hardness	-	6 to 6.5
Sp. Gr.	-	3 to 3.8

Sources

Mandura is the by-product of the metallurgical process during extraction of Iron (Fe) and Copper (Cu) from their respective ores. It occurs as lumps, boulders or aggregates at the areas where smelting activity is carried out for the extraction of copper and iron. Iron is the main constituent of Mandura followed by silica with minor amounts of Cu, S, Pb, Zn, Ag, Cd and Au. Mandura is known since ancient times in India and occurs in over 500 years old slag dumps near village Singhana (Khetri) Distt. Jhunjhunu, Rajasthan.

Types

It is of three types according to Loha

1. Munda Kitta
2. Tikshana Kitta
3. Kanta Kitta

Grahya and Agrahyata of Madhura

स्निग्धं गुरु दृढ़ं चैव कृष्णं कोटरवर्जितम्।
जीर्ण नष्टपुरःस्थञ्च मण्डूरं ग्राह्यमुच्यते॥
(R.T. 20/126)

Mandura which is Snigdha, Guru, Dridha (Hard), Krishna (Black colour), Kotar Varjita (Free from holes) and collected from old destroyed city is of acceptable quality.

शतोत्थमत्तुमं किट्टं मध्यं चाशीतिवार्षिकम्।
अधमं षष्टि वर्षीयं ततो हीनं विषोपमम्॥
(A.P. 3/290)

100 years old - Uttam
70 to 80 years old - Madhyam
60 years old - Adham

अक्षङ्गारैर्धमेत्किट्टं लोहजं तद्गवां जलैः।
सेचयेदक्षपात्रान्तः सप्तवारं पुनः पुनः॥
मण्डूरोऽयं समाख्यातश्चूर्ण श्लक्ष्णं नियोजयेत्।
(R.R.S. 5/150)

Mandura is heated over fire of Vibhitaka's coal and then dipped into Gomutra that is kept in a Patra made up of wood of Vibhitaka. The process is repeated for seven times. The Mandoor becomes as Shakshana Churna.

गोमूत्रौस्त्रिफला क्वाथ्या तत्क्वाथे सेचयेच्छनैः।
लोह किट्टं सुसन्तप्तं यावज्जीर्यति तत्स्वयम्॥
तत्चूर्णं जायते पेष्यं मण्डूरोऽयं प्रयोजयेत्॥
(R.R.S. 5/151)

Triphala Kwatha is prepared by taking Triphala and Gomutra. Mandura is heated and dipped into this Kwatha till it becomes Jirna (Brittle). Now it is ground and made into Churna form.

Marana

1. चूर्णीकृतं तु मण्डूरं त्रिफला क्वथिताम्भसा।
सम्पेष्य सम्पुटे कृत्वा त्रिंशद्वारं ततः पुटेत्॥
एवं नातिचिरादेव रक्त चन्दन सप्रभम्।
मण्डूरं जायते चूर्णं ततो योगेषु योजयेत्॥
(R.T. 20/129-30)

Shuddha Mandura is levigated with Triphala Kwatha and subjected to Puta. The process is repeated for thirty times. Red coloured Bhasma is prepared and it is used in different formulation.

2. कन्या रसेन तत्चूर्णं मर्दयित्वा पुटे पचेत्।
एवं सप्तपुटैर्भस्म मण्डूरस्य प्रजायते॥
(Rasamrita 3/149)

Shuddha Mandura is levigated with Kumari Svarasa. It is dried and kept in Sharava Samputa and subjected to Gaja puta. The process is repeated for seven times.

Probable Physicochemical Changes- In their study done by Gawate Reshma P. et al on Mandura Bhasma shows that one sample of Bhasma was black in colour while two samples of Mandura Bhasma were dark brown in colour. Loss on drying

was 0.20%, 0.21% and 0.54% for Mb1, Mb2, Mb3 respectively. Total ash values were 33.14% 35.53% and 39.86% w/w for Mb1, Mb2 & Mb3. Iron content measured by AAS method was 57.32%, 55.62% and 50.76 % respectively.

Study done by Malik SB on Mandura Bhasma, the XRD analysis shows that raw Mandura contained Fe2SiO4 while Mandura Bhasma contained Fe2O3 and SiO2.

Importance of temperature while processing-For Mandura Shodhana 6300C and Bhasma preparation 8500C temperature required.

Yoga

1. Punarnava Mandura
2. Mandura Vatak
3. Triphala Mandura
4. Shatavari Mandura
5. Mahayogaraj Guggulu

Research update

In their study on the effect of Mandura Bhasma on Lipolytic activities of liver, kidney and adipose tissue of albino rat during CCl4 induced heapatic injury by Devarshi P. et al shows that treatment with Mandura Bhasma prevented the Paraffin mediated and CCl4 mediated changes in the enzyme activities these results suggest the hepatoprotective role of Mandura Bhasma during CCl4 induced hepatic injury.

Vanga (Tin)

Synonyms

वङ्गञ्च वङ्गकं रङ्गं रङ्गकं शुक्रलोहकम्।
कुरूप्यं त्रपुसञ्चैव त्रपु कीर्तितम्॥
(R.T. 18/1)

Vanga, Vangaka, Ranga, Rangaka, Shukralohakam, Kurapya, Trapu, Trapus and Trapu are synonyms to Vanga.

Sources

Tin is not found in native form. It is extracted from different minerals. Its minerals are always mixed with Granite rock. Cassiterite is main are of its. Commercial Tin is obtained from cassiterite. Due to heaviness of Tin oxides it is found as secondary deposits. Tin is obtained from Australia, China, South Africa. In India it is found at Jharkhand.

Important Ores

1. Cassiterite SnO2
2. Cylindrite
3. Canfieldite

Types

खुरकं मिश्रकञ्चेति द्विविधं वङ्गमुच्यते।
(R.R.S. 5/153)

It is of types-

1. Khuraka
2. Mishraka

खुरं तत्र गुणैः श्रेष्ठं मिश्रकं न हितं मतम्॥
(R.R.S. 5/153)

Khuraka is superior while Mishraka is not good.

Grahya Lakshana of Vanga

धवलं मृदुलं स्निग्धं द्रुतद्रावं सगौरवम्।
निःशब्दं खुरवङ्गं, स्यान्मिश्रकं श्याम शुभ्रकम्॥
(R.R.S. 5/154)

Khuraka Vanga is white, soft, smooth, heavy and melts quickly. It should be used for medicinal purpose.

मिश्रकं श्याम शुभ्रकम्।
(R.R.S. 5/154)

Mishraka is blackish white and should not be used.

द्रावेऽतिकठिनं रूक्षं त्वन्य धातु विमिश्रतम्।
धूसरं कठिनञ्चैव मिश्रकं वङ्गमुच्यते॥
(R.T. 18/4)

Mishraka Vanga does not melts easily (compared to Khuraka). Ruksha, mixed with other metal, Dhusara (filthy) and Kathina.

Shodhana

Samanya Shodhana

निषिञ्चेतप्ततप्तानि तैले तक्रे च काञ्जिके।
गोमूत्रे व कुलत्थानां कषाये च त्रिधा त्रिधा॥
(A.F.I. Part I p 242)

1. Vanga	- Q.S.
2. Tila Taila	- Q.S. (For Nirvapana 3 times)
3. Takra	- Q.S. (For Nirvapana 3 times)
4. Gomutra	- Q.S. (For Nirvapana 3 times)
5. Kanjika	- Q.S. (For Nirvapana 3 times)
6. Kulattha Kwatha	- Q.S. (For Nirvapana 3 times)

Vanga is heated and quenched for three times in each of liquid.

Vishesha Shodhana

1. वंगकं द्रावितं सिन्दुवारद्रवे रात्रियुक्तं त्रिधा चेह निर्वापयेत्। शेषकर्माचरेत् पूर्वमार्गेण वै शुक्रलोहं द्रुतं याति शुद्धि परम्॥ (R.T. 18/11)

1. Vanga	- Q.S.
2. Sinduvara (Nirgundi) Swarasa	- Q.S.
3. Ratri (Haridra)	- Q.S.

The melted Vanga is poured in the pot containing Sinduvara Rasa and Haridra Churna. The process is done for three times.

2. खुराभिधानं खलु शुक्रलोहं निधाय दर्व्यां भिषजो वरेण्यः।
चुल्लीगतञ्चाप्यथ गालयित्वा विशुद्धचूर्णोदकपूर्णगर्भे॥
गाढन्तु सच्छिद्रपिधानकेन क्षिपेत्समाच्छन्न मुखे तु कुम्भे।
इत्थं निषिक्तं भिषजाश्ववारं वङ्गं विशुद्धिं समुपैति नूनम्॥
(R.T. 18/8-9)

Khuraka Vanga is taken in a Lauha Darvi and melted. Then it is poured into Churnodaka kept in Pithara Yantra. It is then taken out. The process is repeated for seven times.

Vanga Bhasma preparation is completed into two steps.

1. Jarana 2. Marana

Vanga Jarana

शुद्धं वंग क्षिपेल्लौहे कटाहे सुदृढ़े भिषक्।
तदधो ज्वालयेदानि द्रुते वंगे क्षिपेत् पुनः॥
अपामार्गाचतुर्थांश चूर्णं संचालयेदिदम्।
स्थूलाग्रया लोह द्रव्यां यावद् भस्म प्रजायते॥
चूर्ण प्रक्षेपणं कार्यं स्वल्पं स्वल्पं मुहुर्मुहुः।
ततः शरावपिहितं स्थापयेत्तत्र तद्भिषक्॥
रजः सर्वं ततोऽधस्तात् कुर्यादग्नि तु तीव्रकम्।
यावदंगारवर्णं तद्रजः समुपजायते॥
स्वांगशीते ततो ग्राह्यं मारणाय रजः शुभम्।
कुक्कुटाण्डकपालानां मुक्ताशुक्त्यास्तथैव च॥
चूर्णं पलाशपुष्पाणां वटाश्वत्थत्वचा तथा।
एषामेकैकयोगेन वंग चूर्णं प्रकारयेत्॥
स्वरसेन कुमार्यास्तु वर्याः क्षीरसरेण वा।
(Rasamrita 3/88-931/2)

1. Suddha Vanga	- 1 Part
2. Apamarga Churna	- 1/4 Part
3. Kukkutanda Kapala Churna	- 1/4 Part

or Mukta Shukti Raja/Palasha Pushpa Churna/ Vata Twak Churna/Ashvattha Twak Churna.

The Shodhita Vanga is kept in an iron pan and heated. While it is melting powder of Apamarga is sprinkled and stirred with Loha Daru. The process is continued till the melted Vanga is reduced to powder form. Now it is covered with Sharava and strong heating it done till it becomes red hot. Now heating is stropped and it is left for self-cooling. After self-cooling it is subjected to Marana process. Kukkutanda Kapala Raja/Mukta Shukti powder or Palasha Pushpa Churna or Vata Twak Churna or Ashvattha Twak Churna can also be used for Jarana process.

Marana

1. अथ भस्मसमं तालं क्षिप्त्वाऽम्लेन विमर्दयेत्।
ततो गजपुटे पक्त्वा पुनरम्लेनमर्दयेत्॥
तालेन दशमांशेन याममेकं ततः पुटेत्।
एवं दशपुटैः पक्वं वगं भवति मारितम्॥
(A.P. 3/179-80)

1. Jarita Vanga - 1 Part
2. Shuddha Haratala - 1 Part
3. Nimbu Swarana - Q.S. For Mardana

Method

Jarita Vanga is mixed with Haratala Churna and ground well in Nimbu Swarasa. Small thin Chakrikas are prepared dried and placed in Sharava Samputa and Ardha Gaja Puta is given. This process is repeated for ten times. One fourth part of Haratala is added to Vanga from the 2nd Puta onwards.

2. स्वरसेन कुमार्यास्तु वर्याः क्षीररसेण वा।
विमर्द्य चक्रिकाः कृत्वा ह्यर्धेभाख्ये पुटे पचेत्॥
एवं सप्तपुटैर्वंगं मृतं भवति निश्चितम्।
(Rasamrita 3/94-941/2)

1. Jarita Vanga - 1 Part
2. Kumari Swarasa - Q.S.
   or
   Shatavari Swarasa - Q.S.
   or
   Kshira Sara (Godugdha cream layer) Q.S. (for Maradana)

Method

The Jarita Vanga is ground with the prescribed drug and small thin Chakrikas are prepared and dried. This is kept in Sharava Samputa and subjected to Ardha Gaja Puta. This process is repeated for seven times.

Other processing techniques

Test to check presence of alkalinity in Vanga Bhasma

क्षारशून्यत्व विज्ञान भिषजां स्यात्कथं स्वतः।
रसायनात्तमागण सर्व तदुपदिश्यते॥
रक्तं वर्णकपत्रं चेद्भावनाम्भसि संस्थितम्।
सर्वथा नीलतां नैति क्षार शून्यं ततो वदेत्॥
(R.T. 18/34-35)

The Vanga Bhasma is washed with water and Red litmus paper is is dipped to this water to test the alkalinity. If it does not become blue colour then it indicates the absence of alkalinity in the prepared Vanga Bhasma.

वङ्गं गन्धादियोगेन मारितं तूष्णतां व्रजेत्।
क्षारादिना मृतञ्चेह शीततां याति निर्भरम्॥
(R.T. 18/45)

Vanga Bhasma prepared with Haratala etc. is having Ushna Guna while prepared by using Apamarg etc. is having Sheeta Guna.

Probable Physicochemical Changes

The following physicochemical changes were found in their study done by Lagad CE et al.

Parameter	Raw vanga	Jarita varga	Vanga Bhasma
Total Ash (%)	99.14	99.5	99.09
Acid insoluble ash (%)	92.39	90.04	83.09
Water soluble ash (%)	0.97	2.82	4.56
Tin (Sn)*	99.9%	74.4%	76.5%

By acid digestion method, ICP-AES technique. Lagad C.E et al. IRJP 2013, 4 (2) pp. 97-101.

Importance of temperature while processing- The process of Vanga Shodhana, Vanga crushed and change in form of Churnadaka in Dhalana process. For that 2320C temp. required. In Jarana process Apamarga Panchaga or Ashwatha Panchaga used for Mardana with temp. about 6000-7000C. Foe Vanga Bhasma 6000C temp. required for one hour and minimum six Puta to prepare Vanga Bhasma.

Dosage -125-250 mg

Yoga

1. Trivanga Bhasma
2. Svarna Vanga
3. Nityanand Rasa
4. Ekangveer Rasa
5. Talkeshwara Rasa

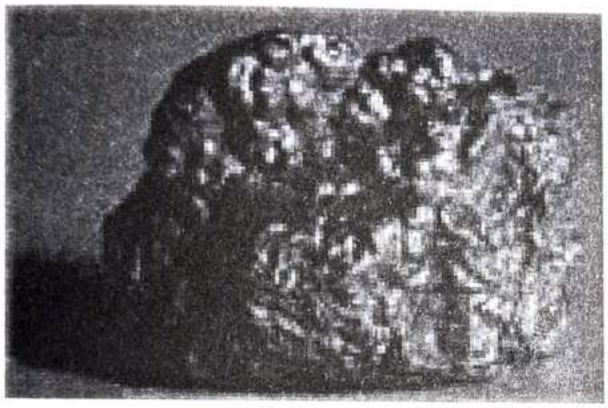
Research updates

In the XRD study of Vanga Jarana peaks were identified as SnO2 (Tin dioxide) and Sn (Tin) and K2Sn2O3 (Potassium tin oxide). The strong peak corresponds to tin dioxide, few peaks corresponds to reduced metallic tin and potassium tin oxide

peak is very low in intensity. In the XRD of Vanga Bhasma strongest peak is identified as SnO2 with a small peak of K2Sn2O3 which was followed from Jarana process.

To screen the toxic effects of Vanga Bhasma, an experimental study was carried out for a 10 days and it was found that Vanga Bhasma has no acute toxic effects on G.I.T. Pacreas and liver even in 1 gm/kg dose.

Naga (Lead)



Synonyms

सीसकं शीषकं सीसं नागकं नागनामकम्।
कुवङ्गकं कुरङ्गञ्च तथा सिन्दूरकारणम्॥
(R.T. 19/01)

Sisak, Shishak, Sisa, Naga, all the name of Naga, Kuvanga, Kuranga and Sindura Karana are the synonyms of Naga.

Sources

Lead does not occur or occurs in very small amount in free state. Normally it is found in compound form with Sulphur. So it is kept under Chalophile in classification. Its minerals are found in the upper surface of earth. Lead has melting point 327.460C.

Its minerals are found in Rajasthan, Tamilnadu, Jharkhand, Punjab and Kashmir in India while Mexico, U.S.A., Myanmar etc. in abroad. The minerals of lead are of follows-

1. Galena - PbS
2. Anglesite - PbSO4
3. Cerussite - PbCO3
4. Boulangerite - Pb5Sb4S11

Types

नागं च द्विविधं प्रोक्तं कुमारं समलं तथा।
कुमारं रसकार्येषु योजनीयं गुणाधिकम्॥
(Bri. Ras. Raj. Sun. Nag. p 80)

Naga is of two types-

1. Kumar-Used in Rasa Karya, Superior
2. Samala-Inferior

Grahya Lakshana of Naga

द्रुतद्रावं महाभारं छेदे कृष्णसमुज्जवलम्।
पूतिगन्धं बहिः कृष्णं शुद्धं सीसमतोऽन्यथा॥
(R.R.S. 5/170)

Sisa is Druta Drava (Melts at low temperature), Mahabhara (Heavy in weight). Chhede Krishna Samujwala (On cutting it shines black), Putigandha (Have foul smell) and Bahi Krishana (Outer surface is black).

Agrahya Lakshana

बहिः शुक्लं भारहीनं रूक्षं छेदे च निष्प्रभम्।
समलं कठिनद्राव सीसकं हेयमादिशेत्॥
(Q.T. 19/3)

Bahi Shukla (Having white outer surface), Bharahina (Light in weight), Ruksha (Rough), Chhede Cha Nishprabham (Lustreless on cutting), Samal (Having impurity) Kathindrava (Melts difficulty) having these characters Sisa is of inferior quality and should not be used.

Shodhana

1. निषिञ्चेत्तप्ततप्तानि तैले तक्रे च काञ्जिके।
गोमूत्रे च कुलत्थानां कषाये च त्रिधा त्रिधा॥
(Sha.Mad. 11/2-21/2)

1. Naga - Q.S.
2. Tila Taila - Q.S.
3. Takra - Q.S.
4. Gomutra - Q.S.
5. Kanjika - Q.S.
6. Kulattha Kwatha - Q.S.

The Naga is melted in an iron pot. It is poured

into an iron pot containing Taila etc. in sufficient quantity. The pot should be covered with a heavy stone having a hole in the centre and the melted Naga is poured through this hole. This process is to be repeated for three times in each of the five liquids.

2. सिन्दुवार जटा कौन्तीहरिद्राचूर्णकं क्षिपेत्।
द्रुते नागेऽथ निर्गुण्ड्यास्त्रिवारं निक्षिपेद्रसे॥
नागः शुद्धो भवेदेवं मूर्च्छा स्फोटादि नाचरेत्॥
(R.R.S. 5/172-173)

1. Naga
2. Nirgundi Swarasa (Containing Nirgundi Root Churna, Renuka Seed Churna and Haridra Churna 1/10 to Naga).

Naga is melted and poured into Nirgundi Swarasa. The process is repeated for three times. Naga becomes free from Murchchha, Sphota etc. Dosha. This process should be done by Pithara Yantra.

3. सीसकं द्रावयेल्लोहदर्वीगतं स्वच्छ चूर्णोदके चाथ निर्वापयेत्। पूर्वमार्गेण वै शेष कर्माचरेत् सीसकं सत्वरं याति शुद्धि परम्॥ (R.T. 19/10)

Sisa is melted in a Lauha Darvi then it is poured into Churnodaka. Then it is taken out. This process in repeated for seven times.

Marana

सीसकं शुद्धमादाय कटाहे गालयेद्भिषक्।
विशुष्काश्वत्थवल्कोत्थं समंचूर्ण विनिक्षिपेत॥
स्वल्पं स्वल्पं मुहुश्चाथ लोहदर्व्या प्रचालयेत्।
सीसभस्म भवेद्यावच्चूर्णं तावत्समापयेत्॥
शशीकृत्य ततो भस्म शरावेण पिधापयेत।
ज्वल्दङ्गारवर्ण स्यात्सीसभस्म यथा चिरम्॥
स्वाङ्गशीतं ततोज्ञात्वा मृतं सीसं समाहरेत्।
बहुशः क्षालयेत्तोयैः क्षारहीनं यथा भवेत्॥
सीसतुल्यां रोगशिलां विमला तत्र निक्षिपेत्।
निम्बूकवारिणा वापि काञ्जिकेनाथ पेषयेत्॥
सम्पुटस्थं ततः कृत्वा पुटयेदतियत्नतः।
इत्थं त्रिभिः पुटैरेव सीसकं मृतिमाप्नुयात्॥
द्वितीयादि पुटे वैद्यस्तुल्यामेव शिलां क्षिपेत।
इत्थं मृतं सीसकन्तु वीतशङ्कः प्रयोजयेत्॥
भस्मसञ्जायते श्लक्ष्णं विशदं कज्जल प्रभम्।
पक्षाघातादिकान् नागदोषान् नैव करोति च॥
(R.T. 19/11-18)

The above process is completed into 2 stages

1. Jarana of Naga
2. Marana of Naga

Naga Jarana

Shodhita Naga is melted in a Lauha vessel. Then small quantity of Ashwatha Twaka Churna is added to it and strong Mardan is done by a Lauha Darvi. The process is done till the whole Naga is converted into power form. Now it is covered with an earthen Sharava and strong heat in given when the Sharva becomes red hot then heating is stopped and it is left for self-cooling. When itself cooled on next day then it is taken out and washed with water till it becomes free from alkalinity. Now it is subjected to Marana process.

Naga Marana

The obtained Naga powder is ground with equal parts of Shuddha Manashila and Nimbu Swarasa or Kanji and pillets are made. It is kept into Sharava and Sharava Samputa is done. It is then subjected to Laghu Puta. The process is repeated for three times. In each Puta Manashila is added. The Bhasma obtained by this process is black in colour and smooth. It is used in Pakshaghata etc.

2. शिलया रविदुग्धेन नागपत्राणि लेपयेत्।
मारयेत्पुटयोगेन निरूत्थं जायते तथा॥
(R.R.S. 2/184)

The paste of Manashila is made with the help of Arka Dugdha and it is smeared on Naga Patra then it is subjected to Puta process. The process is repeated for ten times. The prepared Naga Bhasma is having Niruttha Guna.

Probable Physicochemical changes

The following physicochemical values were obtained in their study done by Verma A. et al.

Parameter	Naga Bhasma (NBAD)			Naga Bhasma (NBAS)		
	I	II	II	I	II	II
Loss on drying at 1050C	00.48	00.39	00.32	00.24	00.19	00.14
Ash Value	99.95	99.90	99.90	99.95	99.85	99.85
Acid insoluble ash	06.4	05.98	05.62	16.58	16.71	16.45
pH	8.29	8.22	8.87	6.12	6.46	6.34
NBAD = Naga Bhasma prepared with Latex of C. Procera NBAS = Naga Bhasma prepared leaf juice of C. procera.						

Verma A, Badarkan P., Galib Patgir BJ, Prajapati PK. Standardization of Naga Bhasma prepared by two different Bhavana dravya. J phytopharmacol 2016;5(5):208-214.

Importance of temperature while processing-For the Dhalana process for the Shodhana of Naga the temp. of 3250C is used. For Naga Bhasma 6000C temp is required.

Yoga

1. Trivanga Bhasma
2. Anatrashosantaka Rasa
3. Brihat Nripati ballabha Rasa
4. Eakangaveera Rasa
5. Nava Ratna Raj Mriganka Rasa

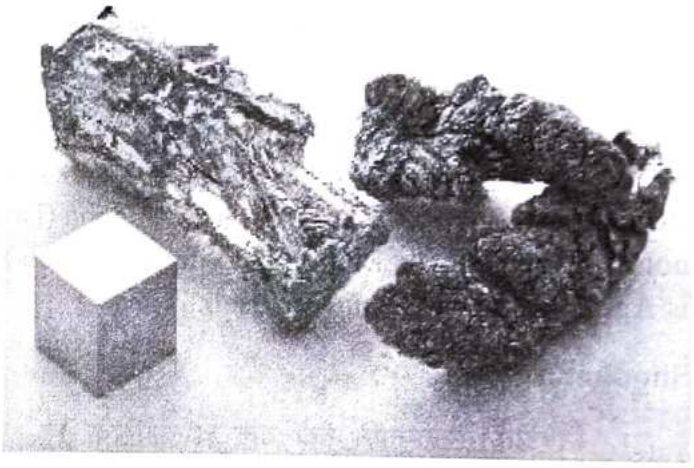
Research updates

Study done by Singh S.K. et al on Naga Bhasma shows that in the prepared Naga Bhasma, by following the reference of Ananda Kanda 2/6/25-28, contains lead in nano-crystallin (60 nm) range in lead sulphide form (Pb+2) associated with the organic contents and different nutrient elements.

Naga Bhasma prepared was found to be totally safe in histopathology study on rats of a dose of 6mg/100g/day.

Naga Bhasma has several variants: black, while, yellows red and green, prepared by using different accompaniments. These may differ from each other in composition. Plumbous oxide (PbO) is yellow. Lead sulphide (PbS) in black, plumbic oxide is purple brown in colour. PbO is diamorphy in yellow and red form.

Yashada (Zinc)



Synonyms

यशदं यसदञ्चैव जशदं जसदं तथा।
रीतिहेतुः खर्परजं समाख्यातं भिषग्वरैः॥
(R.T. 19/94)

यशदं रङ्गसंकाशं रीतिहेतुश्च तन्मतम्।
(A.P. 3/181)

Yashada, Yasada, Jashada, Jasada, Ritihetu, Kharparaja and Rangsamkasha are synonyms of Yashada.

Sources

The ores of Zinc are found in two types of deposits. First is in the form of rakes which are known as thin veins. The second one is in the form of secondary deposit which are formed as a result of weathering of primary mineral. Zinc is having melting point of 419.50C. The ores of zinc are found in Jharkhand, Rajasthan, Punjab, Tamilnadu, Madhya Pradesh etc. in India.

Grahya Lakshana of Yashada

छेदे समुज्जवलं स्निग्धं मृदुलं निर्मलं तथा।
द्रुतद्रावं महाभारं यशदं ग्राह्यमुच्यते॥
(R.T. 19/95)

The Yashada which is Chhede Samujjala (Bright on cutting), Snigdha (Smooth), Mridula (Soft), Nirmala (Free from presence impurities), Druta Drava (Melts early) and Mahabhara (Having weight) is of acceptable quality.

Agrahya Lakshana of Yashada

कठिनं कठिनद्रावं रूक्षं रूक्षप्रभं लघु।
मलिनं यशदं यत्तु तदग्राह्यं प्रकीर्तितम्॥
(R.T. 19/96)

Yashada which is Kathina (Hard), Kathinadrava (Does not melt easily), Ruksha (Rough), Rukshaprabha (Looks rough), Laghu (Do not have weight) and Malina (Having impurities) is Agrahya and should not be used.

Shodhana

1. निषेञ्चेत् तप्ततप्तानि तैले तक्रे च काञ्जिके।
गोमूत्रे च कुलत्थानां कषाये च त्रिधा त्रिधा॥
(Sha. Sam. Mad. 11/2-21/2)

Yashada is heated and quenched into Taila, Takra, Kanjika, Gomutra and Kulattha Kwatha for three times in each of the liquid.

2. जात्यं यशदमादाय लोहदर्व्यान्तु विन्यसेत्।
तीव्राग्निना तु विद्राव्य चूर्णवारिप्रपूरिते॥
सच्छिद्रेण पिधानेन पिहितास्ये घटे क्षिपेत्।
सप्तवारं प्रयत्नेन यशद शुद्धिमाप्नुयात्॥
(R. T. 19/98-99)

Good quality of Yashada is melted in a Lauha Darvi on strong heat then it is poured into Churnodaka. The process is repeated for seven times. For this process Pitha Yantra is used.

Marana

यशदं विमलं न्यस्य कटाहे गालयेद्भिषक्।
अपामार्गस्य चूर्णञ्च स्वल्पं स्वल्पं मुहुर्मुहुः॥
विनिक्षिपेत भिषग्वर्यो लोहदर्व्याथ चालयेत्।
भस्मयावद् भवेत सम्यक् चूर्णं तावत् समापयेत्॥
राशीकृत्य ततो भस्म शरावेण विधापयेत्।
ज्वलदङ्गारवर्णं स्याद्यशदं तु यथा चिरम्॥
तथा प्रदीपयेदग्निं दिनमेकं भिषक्तमः।
स्वतः शीतं ततो ज्ञात्वा यशदं मृतमाहरेत्॥
(R.T. 19/112-15)

1. Shuddha Yashada - 1 Part
2. Apamarga Churna - Q.S.

The Shodhita Yashada is melted in a Loha Vessel (Kadhahi) to this melted Yashada small quantity of Apamarga Churna is added and it is ground with Lauha Darvi. The process is done till the whole of the Yashada turns into powder form. Now it is collected and covered with Sharava and strong heat is given till the colour of Sharava becomes red. Now it is left for cooling. After cooling Yashada Bhasma is obtained.

यशद विशुद्धमादौ विनिधाय वै कटाहे।
अति तीव्र बह्नियोगात् खलु गालयेन्निकायम्॥
दृढनिम्बदण्डदर्व्या परिचालयेत्प्रयत्नात्।
सुमृतं ततो विलोक्य त्ववतारयेत्कटाहम्॥
विमलं प्रदाय तालं चरणाशिकं रसज्ञः।
खलु पेषयेत्प्रयत्नात् पुटवित पुटेत पुटस्थम्॥
रीत्यानया तु यशदं मृतिमेति निर्विशेषाम्।
विविधानुपानयोगात् वितरेतु वीतशङ्कः॥
(R.T. 19/108-111)

Shodhita Yashada is melted in Lauha Kataha (Iron vessel) and it is rubbed with Nimba Danda. The process is done till it becomes in powder form. Now one fourth of Haratala is added to it and Puta is given. By doing the process Yashada Bhasma is prepared and can be used in various diseases with various Anupana (Vehicle).

Bhasma Varna- Shweta/Pandura

Probable Physicochemical Changes

Study done by Pareek et al on Yashada Bhasma, physical parameters values were found as total ash for Bhasma was 99.76%, Acid

insoluble ash 46.10%, Water soluble ash 1.66 and loss on drying 0.01%. XRD result of raw metal shows the presence of crystallite zinc metal while pattern of Yashada Bhasma shows hexagonal ZnO (Zincite) crystalline phase.

Importance of temperature while processing- For the Shodhana of Yashada 419.50C temp. required. For the Yashada Bhasma 700-9000C temp required.

Bhojashettar S. Jadar PG, Rao VN. Pharmaceutical study of Yashad Bhasma. Anc Sic Life. 2012. Jan; 31(3):90-4. doi:10.4103/0257-7941.103181.

Yoga

1. Trivanga Bhasma
2. Pardadi Vati
3. Yashadamrita Malahara
4. Yashadamruta Malahara
5. Vasanta Malati Rasa

Research updates

Various Marana Dravya are used for the preparation of Yashada Bhasma. Parada as well as Haratala are used for the Marana of Yashada Bhasma. In their study done by Kundilkrao IR et.al it was found that Parad Marit Yashad Bhasma contains splaerite (ZnS) as major phase while Zincite (ZnO), Zinc Oxide as minor phase whereas Haratala Marita Yashad Bhasma contains Zincite (ZnO) as major phase while minor phas as Sphalerite (Zns) in the XRD study. The colour of Yashada Bhasma was bright yellowish white in case of Parad Marita while it was dark yellow in case of Hartal Marita.

Studies done on Yashad Bhasma by Aparna Chavaere et. al on bioaccumulation of Zinc in major organs like liver and kidney in Swiss Mice show that Bhasma did not cause any deleterious effects on kidney and liver as indicated by blood chemistry and SPECT studies (Single Photon Emission Computed Tomography).

Mukta (Pearl)

Synonyms

मुक्ता मुक्ताफलञ्चैव मौक्तिक मौक्तिकेयकम्।
शुक्तिजं शौक्तिकेयञ्च शशिरत्नं शशिप्रियम्॥
(R.T. 23/63)

Mukta, Muktaphala, Mauktika, Mautikeya, Shuktija, Shauktibeya, Shashiratna and Shashipriya are synonyms of Moti.

Sources

Moti is formed inside Oyster and it is obtained from it. The word Oyster denotes the Bivalve Molluses belongs to different family found in Marine or Brackish habitat of salty water. In various species these valves are highly calcified with irregular shape. Most of the Oyster or true Oyster are belongs to family Ostreoidea. There is secretion from the outer part of skin of the animal found inside Oyster. Whenever any foreign particle get inserted between skin and valve then layers of secretion get deposits one by one over this particle. When various layers are accumulated then it looks like round and it is the Pearl (Moti). Due to reflection of light in various layer it looks very bright. Chemical composition of Pearl contains CaCO3 i.e. Calcium Carbonate and Kanchialin C30H40N20. It has hardness of 3.5 and Sp. Gr. 2.65 to 2.89.

Cultured Pearl- Such pearls in which their valves are opened and foreign particle is entered and after it is left into water. After sometimes secretion is deposited over it and cultured pearl is

obtained by the Oyster. There is no specific difference between natural and cultured pearl. It is found in Sri Lanka, Japan, China, Australia, Itlay and India.

Types

According to Yoni Bheda it is of eight types-

शुक्ति शङ्खो गजः क्रोडः फणी मत्स्यश्च दर्दुरः।
वेणुश्चाष्टौ समाख्याताः सुज्ञैमौक्तिकयोनयः॥
(A.P. 5/13)

1. Shakti
2. Shankha
3. Gaja,
4. Kroda
5. Sarpaja
6. Matsya
7. Dardura
8. Venu

According to Modern

1. Natural pearl- naturally obtain in sea shell
2. Cultured pearl- sea shell are culture and pearl is obtained

Grahya Lakshana of Mukta

ह्लादि श्वेतं लघु स्निग्धं रश्मिवन्निर्मलं महत्।
ख्यातं तोयप्रभं वृतं मौक्तिकं नवधा शुभम्॥
(R.R.S. 4/13)

Hrilladi (Attracting to mind), Shweta, Laghu, Snigdha, bright and free from impurities (Nirmala), Mahata (big) Toyaprabha (Having lusture like water), Vritta (round shape) having these nine properties Mukta is of best quality.

Agrahya Lakshana of Mukta

दीर्घं पार्श्वकृशं रूक्षं त्र्यस्रं श्यामञ्च सव्रणम्।
हतप्रभं क्षुद्रकायं मौक्तिकं हेयमीरितम्॥
(R.T. 23/66)

Deergha (Long and Unshaped), Parshava Krishra (Thin towards sides), Ruksha (Rough on touch), Triasra (Triangular), Shyam (Black colour) Savaran (Having pores), Hataprabha (Lustureless), Kshudra Kaya (Small in size) having these characters Mukta is of Agrahya quality.

Examination of Natural Mukta

विमर्दितं शालितुषै र्गोमूत्रपटुना भृशम्।
यन्नैति विकृतिं किञ्चित्तन्मौक्तिकम कृत्रिमम्॥
(R.T. 23/65)

The Mukta, which on rubbing with paddy husk or Gomutra with Lavana, does not possess any deformity then it is of Natural variety otherwise it is Kritriman.

Shodhana

जयन्ती स्वरसेनेह दोलायन्त्रं विधानतः।
यामैकं सततं स्विन्नं मौक्तिकं शुद्धिमाप्नुयात्॥
(R.T. 23/67)

Swedana with Jayanti Swarasa for one Yama it becomes Shuddha Mukta.

Marana

विमलं मौक्तिकं गव्यपयसा परिपेषितम्।
त्रिधा लघुपुटे पक्वं मृतं स्याच्छशिसुन्दरम्॥
(R.T. 23/70)

1. Shuddha Moti - 1 Part
2. Godugdha - Q.S. for levigation

Shuddha Moti is ground with Dugdha and Chakrika is made. Then it is kept into Sharava and Samputa is done. Now it is subjected to Laghu Puta. The Puta process is repeated for three times. The Bhasma is prepared having white colour.

Mukta Pishti- It is prepared by doing levigation with rose water.

Probable Physicochemical Changes

The various physicochemical values, for Mukta bhasma as found by Lata Suman et al. in their study are loss on drying, at 1100C (w/w) 0.24%, specific gravity 1.0185, Acid insoluble ash (w/w) 0.34%, Total ash w/w 99.84% , water soluble ash w/w 8.31%, water insoluble ash w/w 91.39%, Calcium was 43.86% w/w and calcium oxide (both by AAs method) 61.36% w/w, while by XRF method calcium was 45.07% w/w.

XRD study shows that in raw Mukta and Mukta Pishti the major peaks are of $CaCO_3$ in Aragonite form while in Mukta Bhasma as calcite form. This change is due to heat given above the temperature of 4000C.

Chemical composition of pearl.

Corbonate of lime	-	91-72%
Organic matter (animal)	-	5.94%
Water	-	2.23%
Loss	-	0.11%

Effect of temperature while processing- Study shows that the chemical composition of the pearl and the shell of pearl oyster indicates that the pearl as well as the shell contain about 90 % of calcium carbonate and a few percent of concholin. XRD pattern indicate crystalline preparation of calcium carbonate from the pearl and shell materials. Calcite is known to form the most stable lattice of calcium carbonate while aragonite is less stable under usual crytallographic conditions. For aragonite crystal to be produced, therefore, certain special conditions should be given such as higher temperature, higher pH value of surrounding media, or a larger growing rate or crystals due to sudden supply of material. So it may be concluded that during Shodhana process which is done on lower temperature no change in the form of calcium carbonate is occurred but during Maran form of calcium carbonate is changed.

Yoga

1. Brihat Kasturi Bhairava Rasa
2. Mukta Panchamrita Rasa
3. Kumar Kalyana Rasa
4. Nava Ratna Rajmriganka Rasa
5. Trilokoja Chintamani Rasa.

Research updates

Study on Antiulcer activity of Mukta Bhasma in the experimental animals (Rats) by cold restraint stress induced ulcer model and Diclofenae induced ulcer model shows that Mukta Bhasma produced significant (CP<0.001) 57.53% and 59.18% at 60 mg/kg and 120 mg/kg dose level respectively, when compared with control. Result of this study also suggest that it possess significant gastro protective and antiulcer activity in lower doses of therapeutic range and its effect is not dose dependent.

Pravala (Coral)

Synonyms

प्रवालक प्रवालाश्च भौमरत्नश्च विद्रुमम्।
अब्धिजन्तुविशेषोत्थं तदेव परिकीर्तितम्॥
(R.T. 23/128)

Pravalaka, Pravala, Bahauma Ratna, Vidruma and Abdhijantu are synonym to Pravala.

Sources

Corals are marine invertebrates animal that comes under class Anthozoa of Phylum Cylentrata. These lives in the form of colony of which single animal is termed as Polyp. The Calcium carborate ($CaCO_3$) excreted by them provides its hardness. These polyps are identical to each other. These polyps are sac like animal having diameter in millimeter and length in centimeter. They excrete exoskeleton towards its base. In this manner they excreted it for a long time one over another so that their length becomes several meters. In this fashion coral reef in formed. For the development of reef specific water and temperature is needed. So, these are found in some specific sea. These are abundantly found in some specific sea. These are abundantly found in the northern Australia and Mediterranean Sea between Europe and Africa. In India it is obtained from Rann of Kachchha. Hardness of Coral is 3.5 while Specific Gravity is 2.6 to 2.7.

Types

It is of two types :

1. Pravala Shakha - Lata Sadrisha
2. Pravala Mula - Like Honey comb.

Four types

1. Rakta
2. Shweta
3. Krushna
4. Dyussara, Among these Rakta Pravala is considered the best.

Grahya Lakshana of Pravala

पक्वबिम्बफलच्छायं वृत्तायतमवक्रकम्।
स्निग्धमव्रणकं स्थूलं प्रवालं सप्तधा शुभम्॥
(R.R.S. 4/17)

Colour having similar to that of ripened Bimbi Phala, Vritta (Rounded shape), Ayata (Rectangular), Avakrakma (Straight), Snigdha (Smooth), Avrana (Free from scratch) and Sthula (Thick) Praval having these characters is of best quality.

Agrahya Lakshana of Pravala

पाण्डुरं धूसरं रूक्षं सव्रणं कोटरान्वितम्।
निर्भारं शुभ्रवर्णञ्च प्रवालं नेष्यतेऽशुभम्॥
(R.R.S. 4/18)

Pravala having Pandu (Whitish yellow), Dhusara (Filthy white), Ruksha (Rough), Svarna (Having scratch on its surface), Kotara (Having pores), Nirbara (light) and Shubhra Varna (white colour) is of unacceptable quality.

Pravala Shodhana

जयन्तयाः स्वरसेनेह दोलायन्त्रे तु विद्रुमम्।
यामैकं सुपरिस्विन्नं शुद्धिमायात्यनुत्तमाम्॥
(R.T. 23/131)

By doing Swedana in Dola Yantra using Jayanti Swarasa for one Yama it becomes Shuddha.

Pravala Marana

विशोधितं विद्रुमं तु श्लक्ष्णचूर्णं तु कारयेत्।
कन्याम्भसाऽथ सम्पेष्य शोषयेत् कृत चक्रिकम्॥
सम्पुटस्थं ततः कृत्वा त्रिवारं पुटयेद्भिषक्।
एवं पुटत्रयैर्भस्म जायते शशि सुन्दरम्॥
(R.T. 23/134-35)

Ingredients-

1. Shuddha Pravala - 1 Part
2. Kumari Rasa - Q.S. for Bhavana

Pravala Churna is levigated with Kumari Rasa and Chakrika is made and dried. Now these are kept in Sharava and Samputa is done. Then it is subjected to Puta. The process is repeated for three times the colour of Bhasma is white.

Other processing techniques

Pravala Pisthi- Suddha Pravala is levigated with rose water for 21 days. The Pisthi is prepared having pink colour.

Probable Physicochemical Changes

The various physicochemical parameters of raw, Shuddha and Pravala Bhasma as well as of Pishti are as follows-

Sr. No.	Sample	pH	Loss on drying	Ash value	Acid insoluble Ash	Water soluble extractive	Alcohol soluble
1.	Praval Mula (Raw)	8.8	0.49	59.37	1.29	1.36	2.035
2.	Praval Shakha (Raw)	9.1	0.47	57.60	0.57	1.58	1.641
3.	Praval Mula (Shodhita)	9.3	0.45	61.49	1.31	2.40	1.98
4.	Praval Shakha (Shodhita)	9.4	0.39	58.44	0.71	1.92	1.15
5.	Praval Mula Bhasma	10.2	0.72	68.76	1.43	9.67	4.46
6.	Praval Shakha Bhasma	10.6	0.82	64.35	1.28	6.16	4.74
7.	Pravalmula Pisthi	9.3	1.52	58.84	1.91	3.85	6.02
8.	Praval Shakha Pisthi	9.7	1.14	56.66	1.83	8.20	8.20

The above study was done by Arushi K et al. A comparative analytical study of Praval Bhasma and Pisti w.s.r. to Moola and Shakha. Int J. Ayu. Pharma Chem. Vol 2 Issue 1. 2015 pp 70-77.

Importance of temperature while processing-For prepapration of Pravala Bhasma 8000C temp. is required for 30 minutes and for Shodhana 900-1100C temp. required.

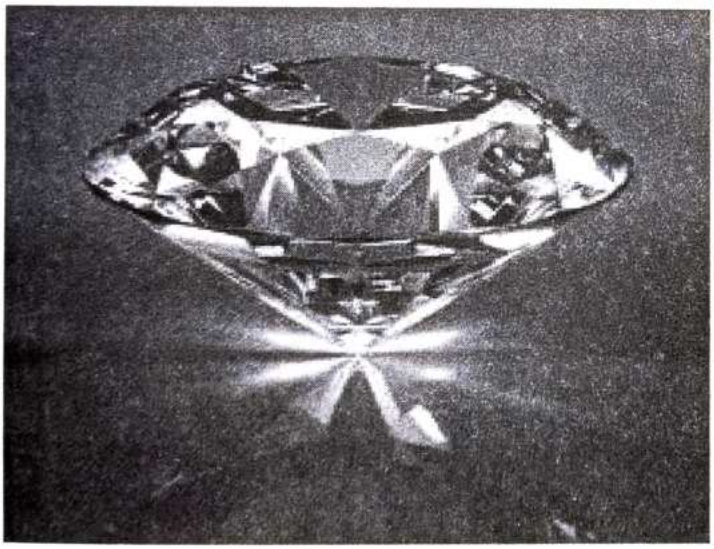
Yoga

1. Pravala Panchamrita Rasa
2. Ratna Garbha Pottali
3. Brihta kasturi bhairava Rasa
4. Nava ratna rajmriganka Rasa
5. Birhata vata chintamani Rasa

Research updates

Coral skeletous are composites of 97.5 w% aragonite (CaCO3), 0.07 w%. organics and up to 2.5 w% water associated with organics.

Vajra (Diamond)



Synonyms

हीरको हीरकं हीरमभेद्य भिदुरं तथा।
कुलिशं वज्रकं वज्रं तथोक्तं भार्गव प्रियम्॥
(R.T. 23/5)

Heeraka, Heera, Heerama, Abhedaya, Bhidura, Kulisha, Vajaraka, Vajra and Bhargava Priya are Synonyms of Varja

Mineralogical Identification

Colour Habit	-	Octahedral
Cleavage	-	Perfect
Lustre	-	Adamantine, Greasy
Streak	-	None
Tenacity	-	Brittle
Fracture	-	Irregular
Hardness	-	10
Specific Gravity	-	3.5

Sources

It is found in alluvial formation and volcanic pipes filled with kimberlite along with it is also found in Igneous rock chiefly associated with serpantine. Diamond is very bright colour gem. Chemically it is carbon in which carbon atoms are in cubic arrangement. It is hardest substance. Diamond does not have any specific colour. Normally it is colourless but may be available in different colours. It shines very bright due to total internal refraction. Diamond is available in transparent, opaque and translucent. Colourless diamond composed of carbon atoms but coloured diamond composed of silicon, aluminium, boron, iron, magnesium etc. elements. According to mythological view Heera is originated from the bone of Saga Dadhichi.

In India it is obtained from Golakunda (Andhra Pradesh), Panna (M.P.) and Vijayanagarnam (Karnataka). In abroad it is found in South Africa, Australia, Brazil etc. countries.

Types

1. It is of three types according to sex.
   वज्र च त्रिविधं प्रोक्तं नरो नारी नपुंसकम्॥
   (R.R.S. 4/263)
   a. Nara (Male)
   b. Naari (Female)
   c. Napunsaka
2. According to colour it is of four types-
   a. Shweta
   b. Rakta
   c. Peeta

d. Krishana

3. According to Varna (Class) it is of four types:

ब्रह्मक्षत्रियविटशूदं स्वस्ववर्णफलप्रदम् ।
(R.R.S. 4/304)

a. Brahmana (white colour)-Rasayanartha
b. Kshtriya (red colour)-Roganashaka
c. Vaishya (yellow colour)-Dhatukarma
d. Shudra (black colour)-Vayahsthapaka and Roga Shamanartha

Characters of Vajra

अष्टास्त्रंञ्चाऽष्टफलकं षट्कोणमतिभासुरम् ।
अम्बुदेन्द्रधनुर्वारितरं पुंवज्रमुच्यते ॥
तदेव चिपिटाकारं स्त्रीवज्रं वर्तुलायतम् ।
वर्तुलं कुण्ठकोणाग्रं किञ्चिद्गुरु नपुंसकम् ॥
(R.R.S. 4/27-28)

Nara Vajra- Having eight Asra (Corner), eight Phalaka (Surface) six Kona (Angle), Ashta Kona (very bright), shines like Indra Dhanusha (Rainbow) and Varitara (Floats in water) is of Nara variety.

Nari Vajra- The above-mentioned characters along with Chipatikara (flat in shape).

Napunsaka Vajra- Having characters of Vartula (Round in shape) Ayata (Rectangle), Kuntha Konagra (Deformed angles) and KinchitaGuru (Slightly heavy) is of Napunsaka variety.

Grahya Lakshana of Vajra

स्निग्धं विद्युद्विभं स्वच्छ मलेख्यं च विलेखनम् ।
तीक्ष्णं षट्कोणमष्टास्त्रं नात्यं हीरकमुच्यते ॥
(R.T. 23/6)

Snigdha (Smooth in touch), Vidyuta Vibha (Bright flashes of light), Svachchha (Free from impurity), Vilekhana (Scrapping property), Tikshana (Sharp), Shatakona (six Angles) Ashtasra (eight Surface) is of best quality.

Agrahya Lakshana of Vajra

वर्तुलं मलिनं नीलं भूत्याभं स्फुटितं खरम् ।
स काकपदं रेखाद्वयं हेयं हीरकमादिशेत् ॥
(R.T. 23/7)

Vartula (Round), Malina (Having impurities), Neela (Blue coloured), Bhutyabha (Lusture of ash), Sphutita (Cracked), Khara (Rough), Kakapada (Symbol of crow leg) and Rekha Dwaya (Having lines) is of Agrahya quality.

Heera Dosha

बिन्दुः काकपदं यवः किल मलो रेखेति नाम्नोदिता ।
दोषाः पञ्च पवेरथात्र कथितो बिन्दुः समो बिन्दुना ॥
(A.P. 5/32)

The following five are Dosha of Heera (If it is having)

1. Bindu
2. Kakapada
3. Yava
4. Mala
5. Rekha

1. Bindu

कृष्णो रक्त इति क्रमेण स पुनर्द्वेधा मतो वर्तुला ।
वर्ताकारभिदा ग्रहीतुरफलः शस्त्रो न सर्वाऽपि सः ॥
(A.P. 5/32)

Black or Red coloured round shape, flat it should not be used.

2. Kakapada

ज्ञेयं काकपदं तु काकचरमाकारं परीक्षकृता ।
वज्रे श्रीमति संस्थितं पुनरिदंधर्तुर्भवेन्मृत्युदम् ॥
(A.P. 5/33)

Having symbol similar of Kakapada (Crow leg) it causes death on bearing.

3. Yava

रक्तापीतसितासितच्छविभिदा ज्ञेयाश्चुर्धा यवाकारस्तत्र ।
यवः सितः खलु पवेः पूज्योऽपरे निन्दिताः ॥
(A.P. 5/33)

Having Yava like structure having colour of Rakta, Pita, Sita and Asita (Black) are Yava Dosha. White coloured Yava is best other are Adhama.

4. Mala

धाराकोणकमध्यसंस्थिततया त्रेधा मल्लो रत्नविद्ध्याख्यातः स पुनर्ग्रहीतुरनल व्याघ्रादि भीतिप्रदः ॥ (A.P. 5/34)

Mala is present in Dhara, mid of Kona (Angle) and it is of three types. By bearing Heera having Mala Dosha is more prone to harm due to Agni and Vyaghradi.

5. Reka

सव्यासव्यनिवासिनी तदपरा तत्र स्थिताच्छेदिनीच्छिन्ना चोर्ध्वगतिर्मतोर्ध्वमिति ता रेखाश्चतस्त्रो मतः ॥ (A.P. 5/34)

By left part, right part, piercing third Rekha and piercing fouth one going to upper part these four are Rekha Doshas. Vama (Left) is Uttama and the rest three are Durbhagyakara.

Heeraka Shodhana

कुलत्थ कोद्रव क्वाथे दोलायन्त्रे विपाचयेत् ।
व्याघ्रीकन्द गतं वज्रं त्रिदिनं तद्विशुद्धयति ॥
(A.P. 5/77)

Ingredients-

1. Ashuddha Heeraka	-	1 Part
2. Vyaghri Kanda	-	Q.S.
3. Kulattha Kwatha	-	Q.S.
4. Kodrava Kwatha	-	Q.S.

Heeraka is put inside Vyaghri Kanda and now Swedana is done by means of Dolayantra for three days using Kulattha Kwatha or Kodrava Kwatha as liquid media.

Heeraka Marana

1. त्रिसप्तवारं संतप्तं खरमूत्रेण सेचितम् ।
मत्कुणैस्तालकं पिष्ट्वा तद्गोले कुलिशं क्षिपेत् ॥
प्रध्मातं वाजिमूत्रेण सिक्तं पूर्वक्रमेण वै ।
भस्मीभवति तद्वज्रं शङ्खशीतांशुसुन्दरम् ॥
(A.P. 5/83-84)

Nirpava of Heeraka is done in ass urine for twenty-one times, Kalka is made using blood of bed bug and Haratala and Heeraka is kept in this Kalka. Now it is subjected to Gajaputa. The Heeraka Bhasma is prepared having white colour similar to Shankha or Moon.

2. हीरकं रस सिन्दूरं शिला गन्ध च तालकम् ।
कुलत्थ क्वाथसंपिष्टं त्रिदिनं कृतगोलकम् ॥
संशुष्कं तु शरावस्थं रूद्धं गजपुटै र्पचेत् ।
चतुर्दशपुटैरेवं हीरकं मृतिमाप्नुयात् ॥
(Rasamrita 8/89)

Ingredients-

1. Heera Shuddha	-	1 Part
2. Rasa Sindura	-	1 Part
3. Manashila Shuddha	-	1 Part
4. Shuddha Gandhaka	-	1 Part
5. Shuddha Haratala	-	1 Part
6. Kulattha Kwatha	-	Q.S.

All ingredients are mixed and levigated with the help of Kulattha Kwatha for three days. One big Chakrika is prepared and kept in Sharava Samputa and Gajaputa is given. The process in repeated for fourteen times.

Probable Physicochemical Changes

The colour of raw Hirah stones shows mix coloured appearance, rough small chips and thermal conductivity while colour of Hiraka Bhasma is Malina Rakta and the compound shown in XRD study as Fe2O3.

Effect of temperature while processing

Required melting point of Diamond is about35500C and boiling point about 48300C. For preparation Heeraka Bhasma 70 Puta or 9000C for 1 hour is required.

Dosage- 1/20 -1/16 Ratti (6.25 mg to 8 mg)

Yoga

1. Kandarpa Sundar Rasa
2. Navaratna Raja Mriganka Rasa
3. Vasanta Kusumakara Rasa
4. Trailokya Chintamani Rasa
5. Ratnagarbha Pottali Rasa
6. Mahalakshmi Vilasa Rasa

Research update

Solid tumours i.e. Dalton's lymphoma generated in CD 1 mice when treated with Herak Bhasma (Ayu-ND), due to its immunostimulant it reduces tumour cell proliferation and indues

apoptosis aided by the active participation of dendritic cells.

Kaparda (Cowries)

Synonyms

वराटको वराटश्च वराटी च वराटिका।
कपर्दकः कपर्दश्च कपर्दी च कपर्दिका॥
बालक्रीडनकश्चापि चरो वर्यश्चराचरः।
वराटकं वराटं च कपर्द च निगद्यते॥
(R.T. 12/82-83)

Varataka, Varata, Varati, Varatika, Kapardaka, Kaparda, Kapardi, Kapardika, Balkridanaka, Char, Charachar are synonym to Kaparda.

Sources

It is shell of large sea snails (Marine) that belongs to Phylum mollusca. The animal lives inside this shell. It is found in Indian ocean at Maldives, Sri Lanka, Malabar coast and eastern Indian sea coast. The shell is bright smooth and oval shaped.

Types

It is of two types :

1. Varatika 2. Varata

Varatika

पीताभा ग्रन्थिका पृष्ठे दीर्घवृत्ता वराटिका।
रसवैद्यैर्विनिर्दिष्टा सा चराचरसंज्ञिका॥
सार्धनिष्कभरा श्रेष्ठा निष्कभारा च मध्यमा।
पादोननिष्कभारा च कनिष्ठा परिकीर्तिता॥
(R.R.S. 3/130-131)

Varatika having yellowish colour, Granthi (Nods) at back side and have long peripheral (Vrinta). It is also known as Charachar. Varatika having 1.5 Nishka weight is superior to all 1 Nishka weight is medium and having 3/4 Nishka weight is Kanishtha.

Having different characters mentioned above is known as Varata.

Shodhana

1. वराटाः काञ्जिके स्विन्ना यामाच्छुद्धिमवाप्नुयुः।
(R.R.S. 3/134)
2. अम्लेन केनचिद्वापि दोलायन्त्रे विपाचिता।
वराटी याम मात्रेण विशुद्धयति न संशयः॥
(R.T. 12/89)

By doing Swedana process for one Yama with Dola Yantra by using any Amla Drava Kaparda become Shuddha.

Marana

अङ्गराग्नौ स्थिता ध्माता सम्यक् प्रोत्फुल्लिता यदा।
स्वाङ्गशीता मृता, तां तु पिष्ट्वा सम्यक् प्रयोजयेत॥
(A.P 2/300)

By heating it on Angar Agni it become soft and swells on being self-cooled it is grinded and used.

Probable Physicochemical Changes

Physicochemical evaluation of Varatika Bhasma shows that it has pH (1% solution) 10.30, loss on drying (%)0.6566, total ash (%) 96.5590, water soluble ash (%) 3.8001 and acid insoluble ash (%) 1.2779. Raw Varatika contains total calcium (%) as 15.63 while Varatika Bhasma as 19.32%. XRD studies confirmed the formation of more crystalline compound may be due to impact of Shohana and Marana process.

Importance of temperature while processing- For the Shodhana of Varatika, Swedana Vidhi with 90-110^{0}C temp. required. For Bhasma preparation 650^0-700^{0}C temp. required.

Yoga

1. Grahani Kapat Rasa
2. Agnikumar Rasa
3. Praval Panchamrita Rasa

4. Rajmrigank Rasa
5. Loknath Rasa

Research update

Study on Varatika Bhasma on albino rats for its ulcer protective effects show significant result in lower does when compared to Sucralfate. Dose was given Sucralfate 1 gm 6 hourly and Varatika Bhasma 250 mg twice daily. In ulcer index and histopathology studies there were less/no ulcers found in the group treated with Varatika Bhasma in comparison with sucralfate and control group.

Structural and physicochemical analysis showed that cowries shells were mainly composed of aragonite crystals which were converted into poorly crystilline B-type carbonate apatite once soaked at 37^0C in simulated body fluid per 7 days.

Shukti (Oyster Shell)

Synonyms

शुक्तिश्च शुक्तिका चापि मुक्तिमाता तथैव च।
मुक्तागृहं महाशुक्ति मौक्तिक प्रसवा च सा॥
मुक्ताशुक्तिस्तथा मुक्तागेहं मौक्तिकमन्दिरम्।
(R.T. 12/64-65)

Shukti, Shuktika, Muktamata, Muktagriha, Mahashukti, Mauktika Prasava, Mukta Shukti, Muktageha and Mauktika mandira are synonyms to it.

Synonyms of Jala Shukti

जलशुक्तिर्वारिशुक्तिः कृमिभूःक्षुद्र शुक्तिका।
शम्बूका जलडिम्बश्च पुटिका तोयशुक्तिका॥
(A.P. 2/328)

Jala Shukti, Vaari shukti, Krimibhoo, Kshudrashuktika, Shamboka, Jaladimi, Putika and Toyashuktika are synonyms.

Sources

Shukti (Oyester Shell) is a group of animals that belong to class Bivalvia of Phylum Mollusea. These are normally found in alkaline or sea water. These are having structure similar to that of two scoop joining together and are calcified. The animal lives in between both scoop or valve. Oyster from which pearl is obtained is known as Mukta Shukti or Pearl oyster.

Types

It is of two types :

1. Mukta Shukti 2. Jala Shukti

Shodhana

1. जयन्त्याः स्वरसेनैव शुक्तिं दोलागतां पचेत्।
यामैकेनेव नियतं शुक्तिः शुद्धिमावाप्नुयात्॥
(R.T. 12/65)

Swedana in Dola Yantra for one Yama using Jayanti Swarasa it becomes Shuddha.

2. अम्लेन केनचिद्वापि दोला यन्त्रेण यत्नतः।
शुक्तिकां पाचयेद्धीमान् शुद्धिमायात्यनुत्तमाम्॥
(R.T. 12/65)

Swedana in Dola yantra for one Yama using any Amal Dravya Shukti becomes Shuddha.

Marana

शुक्तिकां खण्डशः कृत्वा सम्पुटस्थां ततः पुटेत्।
हिमकुन्देन्दुसङ्काशां शुक्तेर्भूतिं समाहरेत्॥
(R.T. 12/67)

Small pieces of Shukti is kept in Sharava Samputa and subjected to Gajaputa. By repeating the process its Bhasma could be prepared. Ghrita Kumari can be used for levigating process. The prepared Bhasma is of white colour.

Probable Physicochemical Changes

Mukta Shukti Bhasma prepared by Kumari Bhavana has ash value 61.82%, acid insoluble ash 1.21% and loss on drying at 1100C was 0.042%

and the colour of bhasma was olyhmpus white. The pH of Bhasma was 9 when Mukta Shukti Bhasma is prepared by Bhavana of Kumari Swarasa then Bhasma is in calcite form while bhavana with Jala leads to formation of calcium oxide hydrate form.

Importance of temperature while processing- The average temperature for Jala Shukti and Mukta Shukti Bhasma preparation is around 8500C. while for Shodhana it may be between 900 to 1100C.

Yoga

1. Praval Panchamrita Rasa
2. Vadvanala Rasa
3. Grahani Shardoola Rasa
4. Vishamjwarantaka Rasa

Research updates

Oysters are rich in selenium, which supports a number of cellular functions including heavy metal detoxification. Oyster shells mainly consist of calcium carbonate (CaCO3;95%) in addition to a small proportion of organic matrix protein (0.1-5%) which are also called shell/skeleton proteins. Calcined oyster shell powders has attracted considerable attention due to its biocompatibility and antimicrobial and biocidal activities. Recent in vitro and in vivo studies also suggests that nacre is a biocompatible and biodegradable material with osteoinductive, osteoirntegrative and osteoconductive properties.

Shankh (Conch Shell)

Synonyms

शङ्खस्तु शङ्खकः कम्बुस्त्रिरेखश्च समुद्रनः ।
सुनादो दीर्घानादश्च कम्बोजश्च प्रकीर्तितः ॥
(R.T. 112/01)

शङ्खः समुद्रजः कम्बुः क्षुद्रः शङ्खनकः स्मृतः ।
(A.P. 2/255)

Shankha, Shankhaka, Kamboo, Trirekha, Samudraja, Sunada, Dirghanada, Kamboja, Kshudra. Shankhanaka are synonyms to it.

Sources

- It is of following two types

द्विधा स दक्षिणावर्तो वामावर्तः शुभेतरः ।
(A.P. 2/259)

1. Dakshinaavarta 2. Vamaavarta

1. Dakshinaavarta

दक्षिणावर्तशङ्खस्तु प्रशस्तो देवपूजते ।
त्रिदोषघ्नो निधिश्चापि स्मृतो दारिद्र्यनाशनः ॥
(R.T. 12/04)

Dakshinavarta is best for Devpujana. It is Tridoshaghana and Nidhi for Daridranasha.

2. Vamaavarta

वामावर्ताभिधः शङ्खः सर्वत्र सुलभो मतः ।
अतः स एव वैद्यस्तु मारणार्थं प्रयुज्यते ॥
(R.T. 12/05)

It is easily available everywhere so it is used for Marana by Vaidyas.

Types

व्रतः स्निग्धः सूक्ष्ममुखो निर्मलश्चेन्दुसुन्दरः ।
दीर्घकायो गुरूश्चापि शङ्खः श्रेष्ठः प्रकीर्तितः ॥
(R.T. 12/02)

Vritta (Rounded), Snigdha, Sukshma Mukha (Small opening), Nirmala like moon, Deerghakaya (Big shaped), Guru (Heavy) having these properties the Shankha is of best quality.

Shodhana

शङ्खन्तु खण्डशः कृत्वा पोट्टल्यां स्थापयेद्भिषक ।
दोलायन्त्रे चतुर्यामं पचेज्जम्बीरवारिणा ॥
प्रक्षालयेच्छङ्ख खण्डान् प्रतप्तेनाम्भसा ततः ।
इत्थं नातिचिरादेवं शङ्ख शुद्धिमवाप्नुयात् ॥
(R.T. 12/6-7)

Small pieces of Shankha are kept into a Pottali.

Then Swedana is done for four Yama in Dola Yantra using Jambeera Rasa. After completing four Yama it is taken out from Pottali and washed with hot water. By doing this process Shankha becomes Shuddha.

Marana

शुद्ध शङ्खस्य खण्डानि शरावे स्थापयेत्सुधीः।
शरावेण पिधायाथ यत्नात्सन्धिं प्रलेपयेत्॥
आतपे त्वथ संशोष्य पुटेद गजपुटे भिषक्।
स्वतः शीतं समुद्धृत्य खल्वे सञ्चूर्णयेद्भिषक्॥
चूर्णितञ्चाथ विज्ञाय सम्पुटस्थं ततः पुटेत्।
एवं पुटद्वयेनैव शङ्खको मृतिमाप्नुयात्॥
(R.T. 12/17-19)

Small pieces of Shuddha Shankha is kept in Sharava Samputa and Sandhi Bandhan is applied carefully. Now it is dried in sunlight after drying it is subjected to Gajaputa. After self-cooling it is taken out and ground till it become powder. Now the process is repeated using Kumari Swarasa. Bhasma of it is prepared in two Puta having white colour.

Probable Physicochemical Changes

Physicochemical testing of Shankha Bhasma exhibits pH value-10.25, loss on drying (by oven)-0.176% w/w, total ash 95.56% w/w, acid insoluble ash 0.73% w/w and Ca content 46.24% w/w. In this study Bhasma was prepared by classical Puta method and the temperature given was around 8000C. Ca content in raw conch shell was 49.24%. XRD analysis revealed that calcium carbonate present in Bhasma was Calcite as major composition having polygonal structure.

Importance of temperature while processing- For the Shankha Shodhana Swedana process used with temp. of 900C-1100C. For the Shankha Bhasma preparation 8000C temp required

Yoga

1. Shankha Varti
2. Grahanikapat Rasa
3. Praval Panchamrita Rasa
4. Shankha Drava
5. Arjunhara Churna

Research update

In the study done by Cavan S. et al. it was found that calcium carbonate was converted to from its aragonite form to calcite when Bhasma from Shankha was prepared.

Godanti (Gypsum-$CaSO_4 2H_2 0$)

Synonyms

गोदन्तिका च गोदन्ता गोदन्तं कथ्यते बुधैः।
तत्तु पाषाणजातीयं सौम्यं तालसमं न तत्॥
(R.T. 11/237)

Godantika, Godanta, Godant are synonym to it. It is mineral origin and it is not a type or equal to Haratala.

Mineralogical Identification - (Selenite)

Nature	-	Crystalline showing elongated tabular crystals
Colour	-	Greyish white
Streak	-	White
Cleavage	-	Perfect
Fracture	-	Even
Lustre	-	Silky
Tenacity	-	Sectile
Transparency	-	Translucent
Hardness	-	2
Specific Gravity	-	2 to 2.5

Sources

It is found as evaporates, sedimentary deposits imbedded with limestone, red shales and clay stone.

Normally it is found in pure form. In India Godanti is found in Andhra Pradesh, Rajasthan as majority. It is also obtained from Gujarat, Jammu Kashmir, Himachal Pradesh, Uttar Pradesh and Tamilnadu.

Grahya Lakshana of Godanti

पत्राचितं सुमसृणं शरदिन्दुसुनिर्मलम्।
दीप्तप्रभं तु गोदन्तं ग्राह्यमत्र प्रकीर्तितम्॥
(R.T. 11/238)

Patra Yukta (Having layers), Mrishana (Smooth), Shard Indusunirmale (Clear as to that of autumn moon), Deeptprabha (Bright lustre) having these qualities Godanti is acceptable.

Shodhana

गोदन्तं निम्बुनीरेण द्रोणपुष्पीरसेन वा।
यामार्द्धेनैव सुस्विन्नं विशुद्धमति न संशयः॥
(R.T. 11/239)

Ingredients-

1. Godanti - 1 Part
2. Nimbu Svarasa - Q.S.
   Or
   Drona Pushpi Swarasa

Godanti is taken and tied in a cloth and bundle is made. It is hanged in apot (Dola Yantra) and subjected for Swedana in Nimbu Swarasa or Drona Pushpi Swarasa for on hour to 30 minutes.

Marana

1. शरावसम्पुटान्तःस्थं गोदन्तं सुविशोधितम्।
   म्रियते पुटितं भस्म जायते शशिसुन्दरम्॥
   (R.T. 11/240)

Small pieces of Shuddha Godanti is kept into Sharava Samputa and subjected to Shadharana Puta. At the end of process white colour of Bhasma is prepared by doing this process.

2. शुद्ध गोदन्तिजं चूर्णं कुमारीस्वरसैर्दिनम्।
   निम्बपत्र रसैर्वाऽपि मर्दितं कृत चक्रिकम्॥
   शुष्कं गजपुटे पक्वं श्वेतवर्णं प्रजायते॥
   (Rasamrita 5/5-6)

Godanti is levigated with Kumari Swarasa or Nimba Patra Swarasa for one day then Chakrika is subjected to Gajaputa. The prepared Bhasma of Godanti is white in colour.

Probable Physicochemical Changes

Chemical analysis of Haratala Godanti Bhasma show that it has pH (5% w/v suspension) 10.46, ash value w/w% 99, 802, acid insoluble ash (w/w%) 5.275, Loss on drying (at 1100C) w/w%. 2.00, Calcium as Ca (w/w%). 31.970 and Sulphur as S (w/w%) 8.574. in their study done by Kumar G.L. et al.

Effect of temperature while processing- In their study done by Das Subrata K et. al Godanti Bhasma was prepared at 8000C temperature and the structural difference of Gypsum and Godanti Bhasma was characterised by Raman spectroscopy. In Godanti Bhasma some Raman Spectra observed at 129, 177 cm-1 in gypsum and 126, 168 cm-1 in Godanti Bhasma were attributed to Ca ion. The EDX was used to detect elemental composition of Bhasma particle and identified as calcium sulphate.

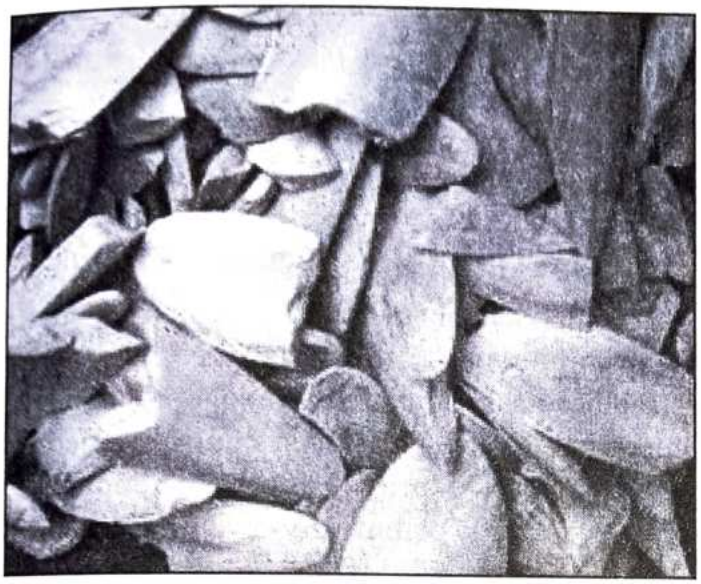
Yoga

1. Godanti Bhasma
2. Tralokya Chintamani Rasa
3. Shankha Drava
4. Kalagni Bhairava Rasa
5. Muktadi Vati

Research update

Experimental models used for antiulcer activity were cold restraint stress induces ulcer model and diclofenace induced ulcer model in rat shows that Godanti Bhasma at the doses of 250 and 500 mg/kg produced significant ($P<0.001$) reduction in ulcer index as compared to control. Yeast induced pyrexia model in rat for the study of anti pyretic activity show that Godanti Bhasma at the dose of 250 and 500 mg/kg body weight decreased the rectal temperature of the rats but not in a dose dependent manner. Likewise Godanti Mishrana showed significant potent antimicrobial effect against staphylococcus aureus in different concentration 1000 mg/ml, 500 mg/ml, 250 mg/ml and 125 mg/ml.

Samudraphena (Cattle Fish bone)



Synonyms

समुद्रफेनः फेनश्च सुफेनः फेनकस्तया ।
अब्धिफेनश्च फेनश्च डिण्डीरोऽब्धिकफो मतः ॥
(R.T. 12/110)

Samudraphena, Phena, Suphena, Phenaka, Abdhiphena, Phena, Dindeera and Abdhikapha are synonyms of Samudraphena.

Sources

समुद्रे वर्तुलः क्षुद्रो दशहस्तसमन्वितः ।
मीनजाति समुत्पन्नो जन्तुरेको विलक्षणः ॥
भीषणाक्षः कूर्मपृष्ठः स यदा विजहात्यसून् ।
तत्पृष्ठास्थि विशुष्कन्तु सुनाभं दृश्यते तदा ॥
अब्धिमध्ये तरत्येतत्तरङ्गैराहतं मुहुः ।
यतोब्धौ फेनवत्तारि त्वब्धिफेनं ततः स्मृतम् ॥
(R.T. 12/124-26)

It is an animal that comes under fish category. This animal is ten Hasta long, having round shaped body. It's eyes are big and dorsal side is similar to Kurma Prishtha. When this animal is died then it's Prishtha Ashthi (Dorsal bony portion) is dried and floats on the surface of sea water and looks like froth so it is termed as Samudraphena.

Cuttle fish- Samudraphena is compared to cuttle fish bone. It is 6-10 inches long having W shaped eyes, two tenacles and eight arms. This animal belongs to phyllum Mollusca. The largest cuttle fish bone belongs to Sepia apama that may be hundred meters long.

Shodhana

पृष्ठास्थीन्यब्धिफेनस्य विलिख्यापनयेत्ततः ।
खल्वे सम्पेष्य कृत्स्नेन श्लक्ष्ण चूर्णञ्च कारयेत् ॥
निम्बूकस्वरसेनाथ भावयेदकवारकम् ।
एवमब्धिकफः शीघ्रं शुद्धिमायात्यनुत्तनमाम् ॥
(R.T. 12/111-12)

Dried Samudraphena is taken in mortar and powdered using a pestle. Later Bhavana is done with equal quantity of Nimbu Swarasa till the powedered Samudraphena gets properly dried.

Physicochemical characteristic

Analysis of cuttle fish bone on various parameter shows loss on drying-16%, total ash value 93.87%, acid insoluble ash 9.6% Crystalline form likening multistoried structures on evenly distributed pillers are seen in microscopic view.

Effect of temperature while processing- Room temperature can be unsed for Shodhana procedure of Samudraphena

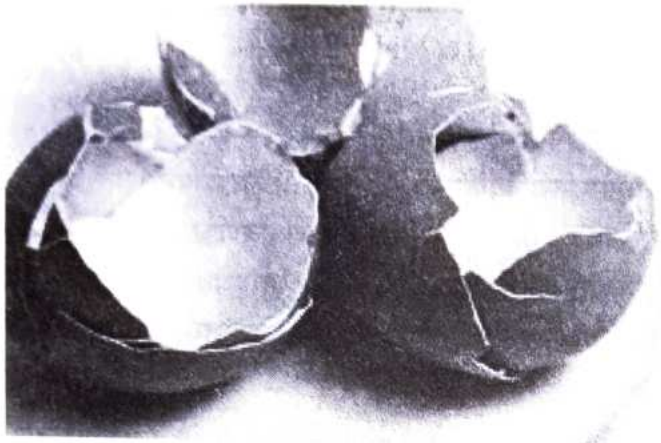
Yoga

1. Jwaradhoomketu Rasa
2. Vadvanala Rasa
3. Suryaprabha Gutika
4. Garunanjana
5. Apasmarnashana Rasa

Research update

Cuttlefish bone and corals contain bioceramics in their exoskeletons, and can be considered main natural resources for obtaining bioceramics. Cuttlefish bone has a highly complicated structure that is mainly composed of biomineral aragonite, which is a polymorph of calcium carbonate.

Kukkutandatwak (Hen's Egg Shell)



Shodhana- It is dipped in Amala or water containing Nausadara and salt both one by eight part for four to six days. Then its inner layer is removed and washed.

Marana- It is levigated with Kumari Swarasa and Chakrikas are made and subjected to Puta using five kilograms Upla. The prepared Bhasma is of white colour.

Probable Physicochemical Changes

The chicken egg shell is 95-97% Calcium carbonate crystals which are stabilized by a protein matrix. XRD* study shows that raw Kukkutanda tvak is $CaCO_3$ (Calcite) and $CaCO_3$ (Calcium Carbonate) whereas the Bhasma contain $Ca_2H_2O_2$ (Portlandite syn) and $Ca(OH)_2$.

Table showing physico-chemical values of Kukkutand twak Bhasma (Sample A)

Sr.No.	Parameters	Value
1.	pH	10.5
2.	Loss on drying (%)	1.54
3.	Ash value (%)	74.34
4.	Acid insoluble ash (%)	0.67

Effect of temperature while processing- For Bhasma preparation Kukundatwaka 800^{0}C is required.

Singh TR, Fanasiya KM, Bedarkar P., Patgiri BJ, Prajapati PK. Analytical profile of Kukkutanda Tvak Bhasma (Incerated hen egg shells) prepared by two different methods. Ayu 2017;38:158-64. doi:10.4103/ayu-Ayu-209-17

Yoga

1. Kursa Kahruva
2. Habba Sundrusa

Research update

Egg shell have been found to contain calcium, magnesium, copper, iron, manganese and many more other useful elements. Calcium one of the content in egg shell had been clinically tried to provide effective prevention of osteoporotic fractures in elderly community-dwelling residents.

Tankanakshara (Borax)

Synonyms

टङ्कणष्टङ्कनस्चैव टङ्कष्टङ्कश्चटङ्कणः ।
द्रावकष्टङ्कण क्षारष्टङ्क क्षारश्च कथ्यते ॥
रंगक्षारस्तथा रंगो रंगदो लोहशोधनः ।
लोहशोधनकश्चापि कीर्तितः स्वर्णशोधनः ॥
सौभाग्यश्च सितक्षारः श्वेतक्षारश्च टंककः ।
क्षारराजश्च कथितो रसायन विशारदैः ॥
(R.T. 13/72-74)

Tankanas, Tankana, Tanka, Tanga, Tangana, Dravaka, Tankankshara, Rangakshara, Ranga, Rangada, Loha Shodhana, Svarna Shodhana, Saubhagya, Sitakshara, Shweta kshara, Tangaka and Kshararaja are synonyms to it.

Mineralogical identification

Nature	-	Crystalline lumps
Colour	-	White
Streak	-	White
Cleavage	-	Poor
Fracture	-	Conchoidal
Lustre	-	Vitreaous
Tenacity	-	Brittle
Hardness	-	2 to 2.5
Specific Gravity	-	1.65 to 1.7
Transparency	-	Translucent
Taste	-	Sweetish alkaline

Sources

Borax is a mineral which is also known as Tincal. It is found deposited in volcanic emanations, hot springs and dried up shallow basins or saline lakes. It is faecal with halites, sulphates and carbonates etc. In India it is found at Gujarata, Rajasthan and Leha.

Types

It is of two types :

1. Tankana - white coloured
2. Neela Kantha Tankana - Neelabha (Best)

In market Sonari Suhaga and Chaukiya Suhaga are available of which Sonari is crystalline, white coloured and in big pieces. It is used for medicinal purpose.

Shodhana

सुचूर्णितं टङ्कणं तु खलु पञ्चपलोन्मितम्।
समुज्जवलोदरे क्षुद्र कटाहे विन्यसेत्ततः॥
चुल्लिकायां निधायाथ पचेद् दर्व्या प्रचालयन्।
सुपुष्पितं नष्टनीरं शुद्धिमायाति टङ्कणम्॥
(R.T. 13/77-78)

Five Pala of powdered Tankana is kept into small pan and heating is done by means of Chullika when its water portion is evaporated and it is Supusphita (Bulged and light weight) then it becomes Shuddha.

Probable Physicochemical Changes

Raw Tankana contains Na2B4O7.10H2O having Rhombohedral structure, while purified Tankana contains Na2B4O7.5H2O having Orthorhombic structure. Quantitively chemical analysis showed percentage of Boran as 10.08% and 13.48% of raw as well as Shodhita Tankana respectively.

Effect of temperature while processing- For the Tankana Shodhana used of pan for Bharjana process.

Yoga

1. Anandbhairava Rasa
2. Mritunjjaya Rasa
3. Prataplankeshwara Rasa
4. Sarvang sundara Rasa
5. Tankantamrita Malhara

9 HAPT.

Rasa Dravya Parichaya-II

Syllabus

Rasa Dravya Parichaya II : Synonyms, mineralogical identification, sources, types, Grahya and Agrahyata, doshas, Shodhana, Marana and other processing techniques, Probable Physicochemical Changes, importance of temperature while processing , Yoga, Research updates of the following.

Desirable to know drugs : Sasyaka (Peacock ore) Kaseesa (Green Vitriol), Gauri pashana (Arsenic oxide); Trinakanta, Akika (Agate), Sudha (Lime stone), Khatika, Ajashthi; Jaharmohara (Serpentine) and Dugdhapashana (Talc).

Learning objective

1. Enlist the important synonyms of Rasadravyas
2. Explain classical &Minerological identification and theirSources.
3. Elaborate types, Grahya-Agrahyata and Dosha of Rasadravyas
4. Explain Shodhana, Marana & and other processing techniqueswith probable chemical reactions.
5. Explain Shodhana, Marana & and other processing techniqueswith probable chemical reactions
6. Explain research updates of Kasisa,Gauripashana and Akika.
7. Enlist names of rasadravyas and important kalpas prepared fromrespective dravya. Describe therapeutic importance of thatRasadravya.

Total - 13 hours (Lecture :07 hour, Non-lecture: 06 hours)
Marks- 10 marks, LAQ (10 Marks)- No, SAQ (5 Marks)- Yes, MCQ- Yes

Sasyaka (Peacock ore)

Synonyms

तुत्थं तु तुत्थकं तुत्थाञ्जनञ्चापि मयूरकम् ।
सस्यकं ताम्रगर्भञ्च शिखिग्रीवञ्च तन्मतम् ॥
(R.T. 21/71)

Tuttha, Tutthaka, Tutthajana, Mayuraka, Sasyaka, Tamtragarbha, Shikhigriva are the synonyms of Sasyaka.

Mineralogical Identification

Nature	-	Crystalline lumps
Colour	-	Berlin or sky blue
Streak	-	Colourless
Cleavage	-	Poor
Fracture	-	Conchoidal
Lusture	-	Vitreous
Tenacity	-	Brittle
Transparency	-	Translucent
Hardness	-	2 to 2.5
Specific Gravity	-	2.12 to 2.30

Source

Tuttha occurs with other hydrated sulphates of copper and iron in the oxidized form near surface zones of copper sulphide ore deposits. It is found generally deposited with mine purified waters, often on the walls of abandoned mine workings. In India natural occurrence of Tuttha in abundance, is

uncommon. A little amount of Tuttha can be seen near copper mines in Rajasthan, Madhya Pradesh and Jharkhand. Mostly commercially manufactured Tuttha as a chemical is used for Ayurvedic formulations in the country.

According to Rasa Text

पीत्वा हालाहलं वान्तं पीतामृतगरुत्मता ।
विषेणामृतयुक्तेन गिरौ मरकताह्वये ।
तद्वान्तं हि घनीभूतं सञ्जातं सस्यकं खलु ॥
(R.R.S. 2/125-26)

Garuna after drinking Amrita first he drank Visha also later and vomited it (Amrita and Visha) on Nilgiri mountain. After sometimes it was solidified giving origine to Sasyaka.

In Rasa Ratna Samuchchaya the description of Sasyaka includes Sasyaka, Mayur Tuttha and Tuttha Kharpara. The term Mayur Kantha is indicated its colour. Mayurkantha includes three colours blue, green and red. Tuttha (CuSO4) does not have green and red colour and it is not similar to Mayurkantha. Peacock ore (Bornite) whose chemical formula is Cu_5FeS_4 is probably Sasyaka. Which is manufactured in laboratory that is Tuttha having formula $CuSO_4.5H_2O$. Rasajalanidhi has also accepted Sasyaka as natural while Tuttha as artificial.

सस्यकं हि स्वभावजं तुत्थकं कृत्रिम मतं ।
एकाभावे परं ग्राह्यं नात्र कार्य विचारणा ॥
(Ra.J.Ni. II part Icha. p 110)

According to Ayurvedic Pharmacopoeia of India Tuttha (Sasyaka) is CuSO4.5H20 which is also known as Blue vitriol, Copper vitriol, blue store or Chalcanthite mineral.

Grahya Lakshana of Sasyaka

मयूरकण्ठसच्छायं भाराढयमतिशस्यते ।
(R.R.S. 2/126)

Sasyaka having colour like Mayurkantha and heavy in weight is accepted for all purposes.

Sasyaka (Tuttha) Shodhana

सस्यकं शुद्धिमाप्नोति रक्तवर्गेण भावितम् ।
स्नेहवर्गेण संसिक्तं सप्तवारमदूषितम् ॥
(R.R.S. 2/129)

Sasyaka get purified when it is Bhavita by drugs of Rakta Varga followed by wetting with Sneha varga. This process should be done for seven times.

Taila Varga

कङ्गणी तुम्बिनी घोषा करीर श्रीफलोद्भवम् ।
कटुवार्त्ताकसिद्धार्थ सोमराजी विभीतजम् ॥
अतसीजं महाकाली निम्बजं तिलजं तथा ।
अपामार्ग देवदाली दन्ती तुम्बरु विग्रहात् ॥
अङ्कोलोन्मतभल्लातपलाशेभ्यस्तथैव च ।
एतेभ्यस्तैलमादाय रसकर्मणि योजयेत् ॥
(R.R.S. 10/71-73)

दोलायन्त्रेण सुस्विन्नं सस्यकं प्रहरत्रयम् ।
गोमहिष्याजमूत्रेषु शुद्ध्यते तुत्थखर्परम् ॥
(R.R.S. 2/130)

When Swedana of Tuttha is performed by Dolayantra using urine of cow, buffalo and goat for three Prahara it becomes Shuddha.

Tuttha Marana

लकुचद्रावगन्धाश्मटङ्कणेन समन्वितम् ।
निरुध्य मूषिकामध्ये म्रियते कौक्कुटैःपुटैः ॥
(R.R.S. 2/131)

Tuttha is ground with Gandhaka, Tankana by using Swarasa of Lakucha and pellets are made. Then these pellets are kept in Musha and its mouth is closed and subjected to Kukutta Puta. This is repeated for three times (R.T. 21/123)

Satvapatana

सस्यकस्य तु चूर्णं तु पादसौभाग्यसंयुतम् ।
करञ्जतैलमध्यस्थं दिनमेकं निधापयेत् ॥
अन्धमूषास्यमध्यस्थं ध्मापयेत्कोकिलाग्नि ।
इन्द्रगोपाकृति चैव सत्त्वं भवति शोभनम् ॥
(R.R.S. 2/132-33)

Sasyaka is ground with one fourth amount of Tankana then it is kept into Karanja Taila for one day. After that it is kept inside Andha Musha and heating is done by using coal as fuel. The Satva of Sasyaka resembling to colour of Indragopa (Red colour) is extracted.

Probable chemical reactions- Since blue vitrol is penta hydrated copper sulphate. At 1000C it loses 4 molecules of crystallization and the following reaction takes place.

$CuSO_4.5H_2O$ 100^0C $CuSO_4.H_2O+4H_2O$

Monohydrated copper sulphate

At 2300C it loses the fifth molecule of water and becomes white amorphous powder. The reaction is as follows-

$CuSO_4.H_2O$ 230^0C $CuSO_4.H_2O$

An hydrous copper sulphate

The powder again becomes blue in presence of water. At 730^0C it under goes dissociation as follows: $CuSO_4.H_2O$ 730^0 $CuO+SO_3$

Importance of temperature

Shodhana of Tuttha is done by two methods of Swedana and Bhavana. The process of Bhavana takes place at room temp., while Swedana occurs at a temp. 90-1100C. Laghuputa or Kukkuata Puta used for Marana of Tittha and Satva Patana 13500C is required.

Patel Manish Kumar et al. A Pharmaceutical analytical study of Tuttha Satva. IJCRT. Vol.6. Issue 2 Apr. 2018 pp 889-896.

Yoga

1. Jatyadi Taila
2. Shweta Malhara
3. Varishoshan Rasa
4. Suchimukha Rasa
5. Sarvajwarir Rasa

Research updates

Muralidhar R et al in their study done on Wistar Albino rats have find that Tuttha Bhasma is much safer to use at therapeutic dose level. However, at higher dose levels there is chances of organ toxicity.

Study done by Vaishagh p. et al. shows that Tuttha Bhasma has better antifungal properties than anti-bacterial properties.

Kaseesa (Green Vitriol)

Synonyms

काशीशकञ्च कासीसं पुष्पकासीसकन्त या।
पांशुकं पांशुकासीसं खगाख्यञ्च प्रकीर्तितम्॥
(R.T. 21/227)

Kasisa, Kashishka, Pushpakasisa, Pamshuka, Pamshu Kasisa, Khaga are synonyms of Kasisa.

Mineralogical Identification

Nature	-	Massive lumps
Colour	-	Greenish white
Cleavage	-	None
Streak	-	White
Fracture	-	Uneven
Lusture	-	Earthy
Tenacity	-	Brittle
Transparency	-	Translucent
Hardness	-	1.95 to 2
Specific Gravity	-	1.90 to 1.97

Sources

Kasisa, a secondary mineral, results from the decomposition of pyrites in the zone of oxidation and is found in small quantities wherever pyrite occurs. It occurs widely as efflorescence on the walls and timbers of mine workings. Kasisa is commonly associated with chalcanthite, gypsum and other hydrous basic sulphates. Mostly commercially manufactured Kasisa as a chemical is used for Ayurvedic formulation in the country. Mineral Kasisa is found from Pyrite mines of Shimha Bhoomi.

Types

In Sushruta Samhita Kasisa has been said to be of two types to which Dalhana has accepted as Bhasma Sadrisha and Pushpa Kasisa. Rasa Ratna Samuchchaya has said it of two types.

कासीसं बालुकाद्येकं पुष्पपूर्वमथापरम्॥
(R.R.S. 3/51)

1. Balu Kasisa
2. Pushpa Kasisa

Rasa Jala Nidhi has described its four types :

1. Balu Kasisa - Shweta Varna
2. Puspha Kasisa- Pita Varna
3. Kritrina Kasisa- Harita Varna
4. Dhatu Kasisa- Shyama Varna

Ayurveda Prakasha has described three types

1. Kasisa
2. Dhatu Kasisa and
3. Pushpa Kasisa

Kasisa is normally available in green colour as Heera Kasisa. It looks like sand so it also known as Balu Kasisa. When it is left for some days then due to effect of atmosphere it's colour become yellow then it is known as Pushpa Kasisa.

Kasisa Lakshana

चूर्णकासीसकं श्वेतमीषत्पीतञ्च कीर्तितम् ।
पुष्पकासीसकं स्वच्छहरिद्वर्ण प्रकीर्तितम् ॥
(R.T. 21/229)

Churna Kasisa is of Shweta Varna (white colour), while Pushpa Kasisa is of Harita Varna (green colour) and Svachchha (clear).

Kasisa Shodhana

1. सकृद्भृङ्गाम्बुना क्लिन्नं कासीसं निर्मलं भवेत् ।
(R.R.S. 3/45)

By giving Bhavana of Bhringraj Swarasa Kasisa for one time becomes Shuddha.

2. कासीसं शुद्धिमाप्नोति पित्तैश्च रजसा स्त्रिया ।
(R.R.S. 3/45)

By giving Bhavana of Pitta Varga or Stri Raja it becomes Shuddha.

Kasisa Marana

काञ्जिकेन तु विभाव्य सप्तधा शोषयेत्खगमिनांशुभिर्बुधः ।
सम्पुटेच्च लघुना पुटेन तत् स्याद्धि भस्म खलु लोहितप्रभम् ॥
समादायाथ तद्भस्म पेषयेन्निम्बुकद्रवैः ।
चक्रिकाः कारयित्वाच पुटेल्लघुपुटे पुनः ॥
यावन्निरम्लं तद्भस्म तावदेवं पुनः पुनः ।
निम्बुकोत्थैः रसैवैद्यः पिष्ट्वा संशोष्य सम्पुटेत् ।
सुश्लक्ष्णं जायते भस्म सर्वदोषविवर्जितम् ॥
तत्साध्येषु विकारेषु वीतशङ्कः प्रयोजयेत् ॥
(R.T. 21/255-58)

The Shodhita Kasisa is crushed with Kanji for seven times then it is subjected to Laghu Puta after doing Sharava Samputa. The process is done till red coloured Bhasma is prepared. Now this Bhasma is ground with Nimbu Swarasa and Chakrikas are prepared and subjected to Laghu Puta. The process is repeated till sour taste is removed.

Satva Patana of Kasisa

तुवरीसत्त्ववत सत्त्वमेतस्यापि समाहरेत ।
(R.R.S. 3/55)

क्षाराम्लैर्मर्दिता ध्माता सत्त्वमुञ्चति निश्चितम् ।
(R.R.S. 3/65)

It is pulverised with Kshara and Amla and then subjected to heating process yields its Satva.

Probable chemical reactions

Kasisa dissolves completely in wate at the temp. of 80-900C. Therefore, after Swedana it comes out through the holes of the bundle and dissolves in the liquid used in Swedana process. To produce Bhasma, a temp. 650^{0}C is required and the colour of the Bhasma obtained is red.

Probable chemical reaction- The heating effect of Green Vitrol is as follows-

$FeSO_4.7H_2O$ 140^{0}C $FeSO_4.H_2O$

$FeSO_4.H_2O$ 300^{0}C 2 $FeSO_4$

High Temperature $Fe_2O_3+SO_2+SO_3$

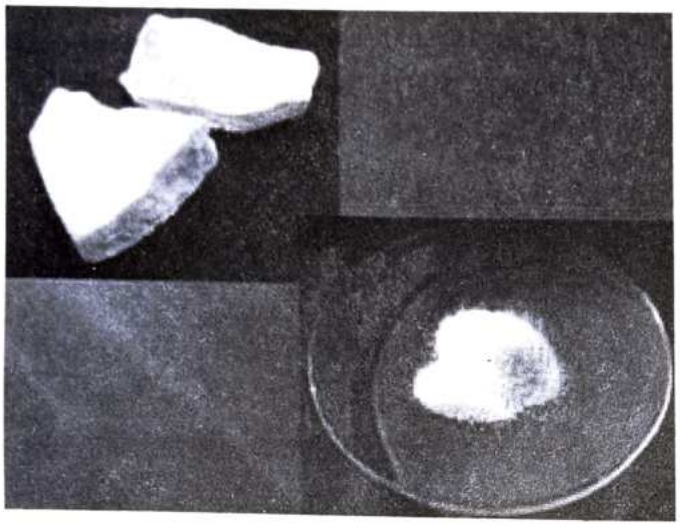
Yoga

1. Rajah Pravartini Vati
2. Shivtrari Rasa
3. Varishoshana Rasa
4. Kasisadi Taila
5. Sarveshwar Parpati

Research update

FTIR sepctra of Kasia Bhasma were evident with the principal peaks correspond to inorganic metal (Fe_2O_3), hydrated metal salt or oxide (FeO or Fe_2O_3). Study on Kasisa Bhasma shows that it is an efficient iron preparation for the management of iron deficiency Anemia.

Gauripashana (Arsenic oxide)



Synonyms

शंखमूषं शंखविषं गौरीपाषाणकं तथा।
दारूमूषं दारूमूषा दारूमोचश्च मल्लकः॥
फेनाश्म भस्म संज्ञाश्च सोमलः सम्बलं तथा।
आसुपाषाणकं चैव रसज्ञैः परिकीर्तितम्॥
(R.T. 11/130-31)

Shankha Musha, Shankha Visha, Gauripashanaka, Darumusha, Darumocha, Mallaka, Phenashma, Bhasma, Somal, Sambal, and Aasupashanaka are synonyms of Gauripashan.

Sources

कृत्रिमः श्वेतमल्लस्तु रक्तश्चाकरसंभवः॥
(A.P. 2/337)

White arsenic is obtained artificially and white yellow coloured is obtained from mountains.

AS_2O_3 is found in mineral form as Arsenolite and Clandetite and both of these are found as secondary minerals in arsenic rich ores. It is often found with Sulphur, Iron and Copper so the ores containing sulphur. Copper and Iron when roasted in furnace the arsenic content is mixed with oxygen and accumulated in the pipes and collected from here. In India it is found in the mines of pyrites.

Mineralogical Identification

Crystallation - Hexxogonal

Colour - Tin, white, tarnishes quickly to grey

Lusture - Submetallic on fresh surfaces

Streak - White

Diaphaneity - Opaque

Cleavage - One direction, distinct

Fracture - Uneven

Elasticity - Brittle

Hardness - 3.5-4

Specific Gravity- 5.6 to 5.8

Types

गौरीपाषाणकः पीतो विकटो हतचूर्णकः।
(R.R.S. 3/124)

It is of three types-

1. Pita
2. Vikat
3. Hata Churnaka

According to Rasaratna Samuchchaya three types :

1. Sphatikabha- Shweta Varna- Uttama
2. Sankhabha- Pandu Varna- Madhyama
3. Haridrabha- Pitavarna-Adhama

Grahya Lakshana Gauripashana

गौरीपाषाणकः पीतो विकटो हतचूर्णकः।
स्फटिकाभश्च शङ्खाभो हरिद्राभस्त्रयः स्मृताः॥
पूर्वः पूर्वो गुणै श्रेष्ठः.....॥
(R.R.S. 3/124)

1. Pita-Sphatika-Superior
2. Vikat-Shankhabha
3. Hata Churnaka - Haridrabha

Shodhana

..... कारवल्लीफलेक्षिपेत्।
स्वेदयेद्भाण्डिकामध्ये शुद्धो भवति मूषकः।
(R.R.S. 3/125)

गवां दुग्धेऽथवा त्वाजे कारवेल्लीरसेऽथवा।
द्वियामं स्वेदितः शुद्धो गौरी पाषाणको भवेत्।
(Rasamrita 4/1)

a. Gauripashana - 1 Part

b. Godugdha/Aja Dugdha/Karvella Rasa - Q.S.

Swedana is done for six hours in Dola Yantra.

सुचूर्णितं शङ्खविषं दृढं वस्त्रेण रोधयेत्।
मेघनाद रसेनैव दोलायन्त्रे विपाचयेत्॥
मृद्वाग्निना दिनैकन्तु शुद्धिमायात्यनुत्तमाम्॥
(R.T. 11/33-34)

Coarse powder of Shankhiya is kept into a Pottali of cloth then Swedana is done for one days with the help of Dolayantra by using Meghanada Swarasa on mild heat. By this process Somal is purified.

Satvapatana

तालवद्गह्योत्सत्वं शुद्धं शुभ्रं प्रयोजयेत्।
(R.R.S. 3/126)

By following the Satvapatana method of Haratala, Satva of Somal is also obtained. It is white in colour.

Probable chemical reactions

In the natural environment arsenic is rarely encountered as the free element most frequently it is a component of sulphuric ores in which it occurs as metal arsenides. Arsenic Trioxide is the primary product of arsenic smelter. During Shodhan or Sattva Patana of Arsenic oxide there may be chance of form change as arsenic trioxide has been reported to exist in three allotropic forms.

Importance of temperature- Arsenic trioxide has been reported to exist in 3 allotropic modifications.

1. Arseniolite- Cubic form, stable below- 13^0C
2. Claudelite- Monoclinic form, at higher temperature . It melts as 313^0C
3. Amorphous, glassy modification- The macromolecular structure is similar to that of claudelite but irregular. Arsenic trioxide begins to sublime at 135^0C.

Yoga

1. Sameer Pannaga Rasa
2. Malla Sindoora
3. Malla Garbha Pottali
4. Chandeshwar Rasa

Research update

Arsenic the ancient drug has remarkable efficacy in the treatment of relapsed acute promyelocytic leukemia (APL). Arsenic trioxide (White arsenic or AS_2O_3) was approved by the United States Food and Drug Administration for being used in the treatment of relapsed/refractory APL in 2000.

Trinakanta (Amber)

Trinakanta is yellow to reddish stone. It shines like gum.

Synonyms- Trinagrahi, Trinkanta, Trinkantamani

Sources

It is obtained from Myanmar, Italy, Rumania etc. countries. In India it is found at Travankara, Kachchha and Nikobar. It is solidified fossil resin from plant origin. It is transparent, bright, clear having light yellow colour or reddish yellow colour and looks similar to resin. It is also known as Kaha Ruba which means that who attracts grass. Chemical formula of Amber is $C_{40}H_{64}O_4$ having hardness of 2.5 and Sp. gr. 11.

Shodhana -Washed in hot water and dried.

Marana- Not done.

Other processing techniques

Pisthi- Its Pisthi is used. It is prepared by

levigating it with rose water, Mogra or Chandana Arka till it becomes very fine powder.

As fossilized tree resin, amber is composed of Volatile and non-volatile terpenoids and/or phenolic secondary compounds (Langenheim, 2002, p 24: Ragazzi and Schmidt, 2011: Vavra 2009) Because amber is fossilized resin it belongs to few organic semi-precious stones. Amber consists of organic compounds of carbon, hydrogen and oxygen. It is still not cleared whether amber should be considered a mineral (without a crystal structure) as a fossil. The most common Baltic ambesis known as amber or succinite.

Effect of temperature- Heat causes amber to darken and dehydrate. Its melting point is between 2850C and 3950C. Because it is fossilized resin so its Pisthi is used to preserve its properties.

Dosage- 2-6 Ratti (250-750 mg)

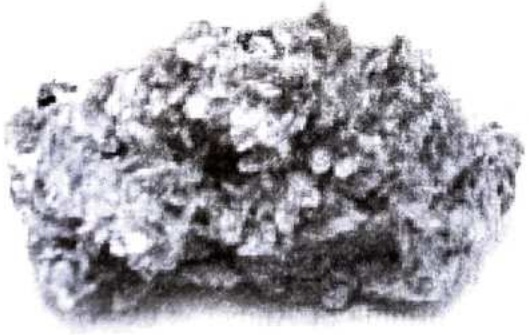
Yoga

1. Javahar Mohara 2. Brahmi Vati

Research updates

The findings of study done Sandra Soumah-Asante et.al provide scientific evidence to support folkloric use of amber as a novel stress buffering and longevity-enhancing nutraceutical.

Akika (Agate)



Akika is a colourful stone. Red coloured Akika is considered the best one.

Mineralogical identification

Nature	-	Banded Form
Colour	-	White
Streak	-	White
Cleavage	-	Not present
Lustre	-	Waxy
Tenacity	-	Brittle
Hardness	-	6 to 7
Specific Gravity	-	2.5 to 2.65

Sources

It is SiO_2 which is banded form of Chalcedony. Normally it is found in pure form. It is found on crust of igneous and metamorphic rock. In India it is obtained from Gujarat, Maharashtra, Andhra Pradesh, Bihar etc.

Types :

1. Blue Lace Agate
2. Crazy lac Agate
3. Dendritic Agate
4. Fire Agate
5. Laguna Agate
6. Moss Agate

Shodhana- Nirvapa with rose water/ Vedmushka Arka/Godugdha for twenty-one times. (Ras. Tan. Sar. Sid. Pra. Sam. Part I p 73).

Marana- Powder of given Bhavana with Vedamusha Arka, cakes are prepared and 3 Puta heat is given.

Pisthi- Fine powder is given Bhavana with rose water arka till fine paste is obtained.

Dosage- 2-4 Ratti ()250mg to 500mg

Sudha (Limestone)

Synonyms

चूर्ण चूर्णक चूर्णन्तु सुधा सौधविलेपनम् ।

तदैव च समाख्यातं शिलाक्षारं भिषग्वरैः ॥
(R.T. 11215)

Churna, Churnaka, Churnantu, Sudha, Saundha Vilepana and Shilakshara are synonym to it.

It is inform of sedimentary rock made from the deposition of aquatic elements like mollusks, forams, coral and siliceous skeleton fragments etc. calcite andaragonite are the main minerals. Calcium doe not occur in natural form but compound froms are phosphate, carbonate, sulphate, fluoride etc.

Sources

Sudha is known as lime having chemical formula CaO. It occurs in mineral form as lime stone. On heating limestone into fire it becomes Shudha. It is found throughout India. Limestone is carbonated sedimentary rock that get accumulated from the skeleton of marine animals like molluses etc. in the form of Calcite/Aregomite and dolomite mineral.

Shodhana and Marana- Not mentioned in classics

Probable chemical reactions

Chemical reaction- $CaCO_3$ (S) CaO (S) + $CO_2\uparrow$
[Limestone]

CaO (s)+H_2O (l) $Ca(OH)_2$
[Quick lime]

Yoga- Churnodaka

Khatika (calcite or $CaCO_3$)

Synonyms

खटिका खटिनी चैव खटी लेखनमृत्तिका ।
कठिनी वै कठिनिका वर्णिका वर्णलेखिका ॥
(R.T. 11/220)

Khatika, Khatini, Khati, Lekhan mritika, Kathini, Kathinika, Varnika and Varna Lekhika are synonyms.

Sources

Khatika has chemical formula of CaCO3. Trace of slit and clay are also present in it. Chalk is sedimentary carbonate rock which is a type of limestone.

Types

खटी गौरखटी चेति द्विधाऽद्या मलिन स्मृता ।
मृदुपाषाणसदृशा खटी शुभ्राऽधिका गुरुः ॥
(A.P. 2/264)

It is of two types having following characters.

1. Khati-Malina (slightly dirty in look)
2. Gaurkhati-Pashana like, Shubhra (white colour) and Guru (heavy).

Shodhana

खटी चूर्णं शुद्धपात्रे निधाय विमले जले ।
प्रक्षालयेद्विधानज्ञो विशुद्धयति न संशयः ॥
(R.T. 11/210)

Ingredients-

1. Khati Churna - 1 Part
2. Water - Q.S.

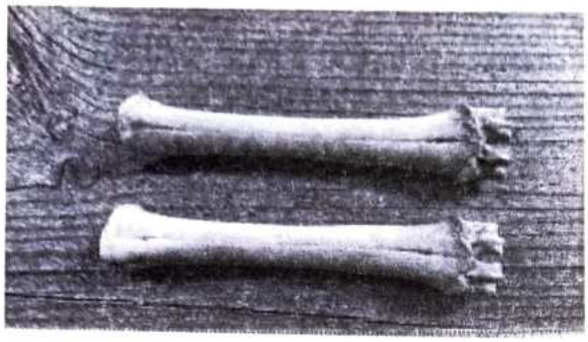
Khati is taken in Khalva Yantra and powdered, to this water is added and stirred properly and then filtered through a piece of cloth. Watery portion is decanted and the thick paste obtained should be dried under sun shade and preserved. By this method Khati becomes Shuddha.

Dosage- 1- 2 Masha (1-2gms)

Yoga

1. Dashansamskara Manjana
2. Mugdha Rasa
3. Khatikadi Churna

Aja Asthi



Aja Asthi is included under Jangama Dravya and it contains rich Calcium and Phosphorus. Aja Asthi is Madhura Rasa, Madhura Vipaka, Ushna Virya and Sushma, Ushna and Vyavayi Guna. Chemical analysis of Aja Asthi reveals the presence of 51.66% calcium and 18.59% phosphors. The quantity of Aja Asthi used is 250mg to 500mg.

Jaharmohara (Serpentine-$Feh_8Mg_3O_8Si$)

Serpentine is called as Naga Pashana in Ayurveda.

Synonyms- Nagapashana, Nagashma, Jaharamohara, Zaharamohra etc.

Mineralogical identification

Nature	-	Crystalline, Coarse grained, Soapy feel
Cleavage	-	Blackish green
Streak	-	Colourless
Cleavage	-	Perfect
Fracture	-	Conchoidal
Lustre	-	Greasy
Transparency	-	Translucent
Hardness	-	3.5 to 5
Specific Gravity	-	2.5 to 2.7

Sources

It is blackish green coloured stone. It is also known as green marble. Jahar mohra is hydrous silicate of magnesium having chemical formula $Mg_6(Si_4O_{10}) \times (OH)_8$. It is formed by metamorphism or late stage hydrothermal action at temperature below 400^0C in the region which is rich in magnesium. Along with magnesium trace amount of Nikil, Calcium, Iron and Aluminium are also found in it. In India it is obtained from metamorphic zone of Rajasthan, Karnataka, Jharkhand, Madhya Pradesh and Andhra Pradesh.

Shodhana

It is heated up to red hot then quenched into Godugdha or Amalaki Swarasa. This process is repeated for twenty-one times. (Ras. Tantra. Sar. Sidd. Pra. Sam. Part 1 p73).

Marana- Powder of Nagapashana should be triturated with milk, Chakrikas are prepared sealed in Sharava Samputa. Then it should be subjected to one Gajaputa heat.

Pisthi- It is prepared with rose water.

Dosage- 1-4 Ratti (125 to 500mg)

Chemical reaction- $Mg_3Si_2O_5(OH)_4 + 3CO_2 + H_2O \rightarrow 3\,MgCO_3 + 2\,SiO_2 + 3H_2O$

(Geology.com)

Importance of temperature

Under high temperature, hydroxyl groups, linked to Mg atoms escape the structure. During this dehydroxylation process, serpentine transformed into amorphous phases between 550-750^0C and then recrystallized into forsterite (Mg_2SiO_4 >750^0C) associated with enstatite ($MgSiO_2$ >800^0C) as the temperature increased.

Research updates-Lizardite, Antigornite and Chrysotill are the main minerals of serpentine group [$Mg_3SiO_2O_5(OH)_4$) belonging to the phyllosilicate

class. Serpentine structure is made of stacked layers composed of two sheets: the tetrahedral layer composed of silicon tetrahedral (SiO_4) linked to the lateral Mg of the octahedral layer by its optical oxygen atoms, forming a covalent bond.

Dugdhapashana (Talc-$H_2Mg_3(SiO_3)_4$ or $Mg_3Si_4O_{10}(OH)_2$)

Dugdhapashana (Talc) is a type of white soft stone and it is a mineral composed of Mangesium silicate.

Synonyms

दुग्धपाषाणको दुग्धी दुग्धपाषाणिका तथा।
दुग्धा दुग्धशिलाचैवक्षीरी क्षीरक्षवश्च॥
वज्राभो दीप्तिकश्चापि सौधो गोमेदसन्निभः।
दुग्धोपलो दुग्धदृषद् भिषग्भिः परिकीर्तितः॥
(R.T. 11/230-31)

Dugdha Pashana, Dugdhi, Dugdha Pashanika, Dugdha, Dugdhashila Kshiri, Ksheer kshaya, Vajrabho, Deeptika, Saudho, Gomeda sannibha, Dugdhopalo, Dugdhadrishada are synonyms to it.

Mineralogical identification

Tenacity	-	Sectile
Cleavage	-	Perfect
Lustre	-	Waxlike
Streak	-	White
Hardness	-	1
Specific Gravity	-	2.58-2.83

Sources

It is found described in Rasamrita, Rasa Tarangini etc. texts. Talc is clay mineral which is hydrated magnesium silicate having chemical formula $Mg_3Si_4(OH)_2$. It is white in colour like milk, very soft and smooth. It can be easily ground. Dugdha Pashana is used as a ingredient to make face powder, body powder, cream etc. It is found in metamorphic rock. It is found in Italy, France, Germany, etc. countries.

Shodhana, Marana - Shodhana and Marana process are not described. The fine powder of its being levigated with rose water before use.

Dosage- 1- 2 Masha (1-2gm)

Importance of temperature-When Talc is heated up to 800^0C there is no change in the crystal structure of the talc. At 800 to 840^0C the talc decomposed to enstatite, amorphous silica and water vapour. Around 1200^0C enstatite gradually changed to clinoenstatite and amorphous silica changed to cristobalite around 1300^0C.

10 HAPT.

Rasa Dravya Parichaya-III

Syllabus

Synonyms, Minerological Identification, sources, types, Grahya, Agrahyata, Shodhana, Marana, Probable Chemical Changes, Properties, dose, Ashuddha/Apakwa, Bhasma Sevanajanya Vydhi and their shantyupaya, yoga, Research updates

Nice to know drugs: Vaikrantha,Vimala (Iron Pyrite),Chapala, Rasaka, Anjana, Kankustha, Agnijara, Giri Sindura (Red oxide of Hg), Mriddarashringa (Litharge), Kamsya (Bronze), Pittala (Brass), Vartaloha., Manikya (Ruby), Tarkshya (Emerald), Pushparaga (Topaz), Nilam (Sapphire), Gomeda (Zircon or Cinnamone stone)Vaidurya (Cats eye), Mriga shringa (Stag horn), Sikata (Silica), Vyomashma (Sangeyashab - Jade), Kousheyashma (Asbestos), Badarshama (silicate of lime).

Learning objective

1. Enlist Synonyms and sources.
2. Determine types, Grahya-Agrahya, properties & classical as well as Mineralogical Identification of Rasadravyas.
3. Explain Shodhana, Marana and Probable Chemical Changes.
4. Explain research update of Badarashma.
5. Enlist Rasadravyas from this group and describe important kalpas with their therapeutic utility.

Total - 9 hours (Lecture :03 hour, Non-lecture: 06 hours)

Marks- 5 marks, LAQ (10 Marks)- No, SAQ (5 Marks)- No, MCQ- Yes

Vaikranta

Vaikranta is the 2nd Maharasa told by the text of Rasa Ratna Samuchchaya. This is also considered as Uparatna by Rasashastra text books like Anandakandha and Rasatarigini

Synonyms

वैक्रान्तंञ्चैव विक्रान्तं वैक्रान्तं जीर्णवज्रकम्।
कुवज्रं क्षुद्रकुलिश चूर्णवज्रञ्च तन्मतम्॥
(R.T. 23/155)

Vaikranta, Vikranta, Jirna Vajra, Kuvajra, Kshjudrakulish, and Churna Vajra are synonym of Vaikranta.

Mineralogical Identification

Nature	- Crystalline prismatic
Colour	- Black
Streak	- Colourless
Cleavage	- None, prismatic faces strongly striated vertically and crystals rounded to barrel shaped.
Fracture	- Uneven
Lusture	- Vitreous
Tenacity	- Brittle and often rather friable
Transparency	- Translucent
Hardness	- 7 to 7.5
Specific Gravity	- 3 to 3.2

Sources

Vaikranta occurs in granite pegatites, commonly in radial crystal form. It also occurs in metamorphic rocks mostly in schists and geneisses. In India it occurs in igneous and metamorphic terrains of Rajasthan. Jharkhand, Bihar and Karnataka. In Rajasthan, it mainly occurs in Udaipur, Bhilwara, Ajmer and Rajasam and districts.

विन्ध्यस्य दक्षिणे भागे ह्युत्तरे वाऽस्ति सर्वतः ।
(R.R.S. 2/60)

According to Rasa Grantha it is found at north and south region of Vindhya mountain.

Nirukti

विकृन्तयति लोहानि तेन वैक्रान्तकः स्मृतः ॥
(R.R.S. 2/60)

It removes the Doshas from Dhatus so termed as Vaikranta.

There is difference of opinion to its modern contemporary Dravya. Fluarspar, Felspar, Rock crystal and Tourmaline are compared with Vaikranta. Ayurvedic Pharmacopoeia of India has accepted Tourmaline as Vaikranta.

Chemical composition- Manganese, Calcium, Lithium, silicon, sodium, iron and Magnesium.

Types

Seven or Eight types of Vaikranta are described in Rasa texts.

1. श्वेतो रक्तश्च पीतश्च नीलः पारावतच्छविः ।
श्यामलः कृष्णवर्णश्च कुर्बरश्चाष्टधा हि सः ॥
(R.S.S. 2/54)

Shweta, Rakta, Pita, Neela, Paravata, Shymal, Krishna and Karbura (Various colour) are eight types of Vaikranta.

2. श्वेतः पीतस्था रक्तो नीलः पारावतप्रभः ।
मयूरकण्ठसदृशाश्चान्यो मरकतप्रभः ॥
(R.S.S. 2/61)

Shweta (White), Pita (Yellow), Rakta (Red), Nila (Bluish), Paravataprabha (Grey), Mayur-kantha like and Markat (Green) are seven types of Vaikranta.

Tourmaline is of three types :

1. Alkali tourmaline
2. Magnesium tourmaline
3. Iron tourmaline

Grahya Lakshana of Vaikranta

अष्टास्त्रश्चाष्टफलकः षट्कोणो मृसणो गुरुः ।
शुद्धमिश्रित वर्णेश्च युक्तो वैक्रान्त उच्यते ॥
(R.S.S. 2/53)

Vaikranta has eight edges (Asra) eight surface (Phalaka) six angles (Konas), Smooth (Mrishna), Heavy (Guru), Black colour (Krishna Varna- A.P. 5/165) and clean (Nirmala). Having these properties Vaikranta is considered as superior quality.

Vaikranta Shodhana

1. वैक्रान्तकाः स्युस्त्रिदिनं विशुद्धाः संस्वेदिताः क्षारपटूनि दत्त्वा ।
अम्लेषु मूत्रेषु कुलत्थरम्भानीरेऽथवा कोद्रववारिपक्वाः ।
कुलत्थक्वाथसंस्विन्नो वैक्रान्तः परिशुध्यति ॥
(R.S.S. 2/65-66)

Vaikranta becomes purified when Swedana of its is done in Kanji, Mutra, Kulattha Kwatha, Kadalimula Rasa, Kodrava Kwatha or Kshara and Lavana for three days by means of Dola Yantra.

2. हयमूत्रेण तत्सेच्च तप्तं तप्तं त्रिसप्तधा ।
(Rasa. Chinta. 7/63)

Heating up to red hot and then quenching into horse urine for 21 times, Vaikranta becomes purified.

Vaikranta Marana

1. म्रियतेऽष्टपुटैर्गन्धनिम्बुकद्रव संयुतः ॥
(R.R.S. 2/67)

Vaikranta is mixed with equal part of Gandhaka and Chakrikas are made by grinding it with Nimbu Rasa then it is subjected to Puta by keeping into Shrava Samputa. By giving eight Puta Vaikranta Bhasma is prepared.

2. वैक्रान्तेषु च तप्तेषु हयमूत्रं विनिक्षिपेत् ।
पौनःपुन्येन वा कुर्याद् द्रवं दत्त्वा पुटं त्वनु ॥
भस्मी भूतं तु वैक्रान्तं वज्रस्थाने नियोजयेत् ॥
(R.R.S. 2/67-68)

Vaikranta is heated and dipped into hoarse urine for several times. Then it is levigated by horse urine and Puta is given. Bhasma prepared by doing this method can be used in place of Heeraka Bhasma.

Colour of Bhasma- Raktabh (Redish)

Probable Chemical Changes

Tourmaline is a six-member ring cyclosilicate having a trigonal crystal system. Study on Vaikranta Bhasma shows that it is a multi-mineral compound which contains iron and silica as major constituents. Vaikranta Bhasma scanned under FESEM shows that it is well agglomerated, having very tiny particle unarranged and irregular in shape with amorphous/semicrystalline nature.

Properties

आयुःप्रदश्च बलवर्णकरोऽतिवृष्यः प्रज्ञाप्रदः सकलदोषग-दापहारी ॥ दीप्ताग्निकृत्पविसमानगुणस्तरस्वी वैक्रान्तकः खलु वपुर्बललोहकारी ॥ रसायनेषु सर्वेषु पूर्वगण्यः प्रतापवान् ।
(R.R.S. 2/55-56)

Vaikranta is having properties of Ayuprada, Bala Varnakar, Ati Vrishya Pragiya Prada, Sakal Dosha Rogahar, Deeptagni, qualities similar to Hirak, Vapubala Lohakari and superior Rasayana amongst all.

Dose

तत्त्वांशतो रक्तिकाया रुद्रांशप्रमितं मृतम् ।
वैक्रान्तकं प्रयुञ्जत बलकालाद्यपेक्षया ॥
(R.T. 23/170)

1/24 Ratti- 1/8 Rati (5 mg to 15 mg) according to Bala and Kala of patient.

Ashuddha Vaikranta Sevan Janya Dosha

अशुद्धौ वज्रवैक्रान्तौ किलासं दाहसंमतिम् ।
पार्श्वपीड़ा तथा पाण्डु कुरुतस्तौ विशोधयेत् ॥
(A.P. 5/168)

When it is used without doing Shodhana it causes Kilas, Daha, Parshvapida,

Pandu so it should be used after Shodhana.

Yoga

1. Vasant Kusumakar Rasa
2. Suchika Bharana Rasa
3. Nava Ratna Rajmriganka Rasa
4. Ratnagiri Rasa
5. Apoorva Malini Vasant Rasa

Research updates

Research study was done on Vaikranta Bhasma in place of Vajra Bhasma to evaluate its anti-tumour activity on Ehrlich Ascites Carcinoma in experimental animals. Analysis on their blood and hepatic tissue for Survival time, Haematological profile, biochemical markers and antioxidant status showed that Vaikranta Bhasma possesses potent antitumour activity in mice.

Vimala (Iron Pyrite Fe2S3)

Vimalaa is the 4th Maharasa as explained in Rasa Ratna Samuchchaya. This has been mentioned for 1st time by Rasarnava in 10th century.

Synonyms

Vimala, Tapeeza

Mineralogical Identification

Nature	- Massive, Cubic
Colour	- Palebrass yellow, Tarnishes darken and iridescent
Cleavage	- Indistinct
Streak	- Greenish black
Fracture	- Uneven but sometimes choncoidal

Tenacity	- Brittle
Lusture	- Metallic
Hardness	- 6 to 6.5
Specific Gravity	- 4.9 to 5.2

Sources

Normally it is found in quartz veins sedimentary rock and metamorphic rock as sulphide or oxides. It is found with gold in less quantity so known as fool's gold also. It is associated with Calcite, Barite, Quartz flurite, Hematite, Galena etc. In India it is found in Simha Bhumi (Jharkhand), Saladipura (Bihar) and Dharvad (Karnataka).

Types

विमलस्त्रिविधः प्रोक्तो हेमाद्यस्तारपूर्वकः।
तृतीयः कांस्यविमलस्तत्तत्कान्त्या स लक्ष्यते॥
(R.R.S 2/95)

It is of three types-

1. Hema Vimala - Pita Varna
2. Tar Vimala- Shweta Varna
3. Kansya Vimala - Kansya Varna

Grahya Lakshana of Vimalaa

वर्तुलःकोण संयुक्तः स्निग्धश्च फलकान्वितः।
(R.R.S 2/96)

Vimala which is Vartuala (Round) having Kona (Angles), Snigdha (smooth) and Phalaka (Surface) is of best quality.

Shodhana

1. आटरूषजले स्विन्नो विमलो विमलो भवेत्।
(R.R.S 2/98)

When Swedana of Vimala is done by using Vasa Swarasa it becomes Shuddha.

2. जम्बीर स्वरसे स्विन्नो मेषशृङ्गीरसेऽथवा।
आयाति शुद्धिं विमलो धातवाश्च यथाऽपरे॥
(R.R.S 2/98-99)

When Swedana is done by using Jambeer Swarasa or Meshshringi Swarasa it becomes Shuddha.

Marana

गन्धाश्मलकुचाम्लैश्च म्रियते दशभिः पुटैः।
(R.R.S 2/100)

Vimala is ground with equal part of Gandhaka and sufficient quantity of Lakucha Swarasa and pellets are made then Puta is given by doing Shrava Samputa. The process is repeated for ten times i.e. 10 Puta is given.

Probable Chemical Changes

Study done by Shweta S Nayak et al. on Vimala shows that raw Vimala can be considered as Iron havic cubic crystal structures. Vimala Bhasma prepared by classical Puta method as well as EHMF was identified as ferrous sulphide and ferric oxide. The crystal structure was found to be hexagonal and cubic.

Properties

मरुत्पित्तहरो वृष्यो विमलोऽति रसायनः।
(R.R.S 2/96)

It pacific vitiated Vata, Pitta, Vrishya and superior Rasayana

Dose- 1/2 Ratti to 2 Ratti

Apakwa/Ashuddha Sevenjanya Vikara Shanti

विकारो यदि जायेत विमलाया निषेबणात्।
शर्करा सहिता भक्षेत् मेषशृङ्गी दिनत्रयम्॥
(Vr.Ra.Raj Sun. Vimala 111)

When Meshashringi is administered with Sugar for three days it pacifies the Vikar originated from ingestion of Apakwa/Ashuddha Vimala.

Yoga

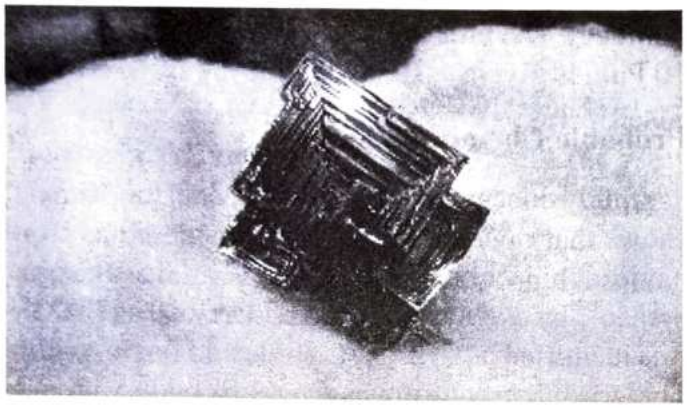
1. Vimala Rasayana
2. Shighra Prabhava Rasa
3. Shulantaka Rasa
4. Sarveshwar Rasa
5. Navaratna Rajmriganka Rasa

Research updates

Study on iron (Pyrite) disulfide nanocrystal suggests that it could be a excellent antimicrobials

and it does not significantly influence the cytotoxicity proving its as a nontoxic metallic Sulphide.

Chapala (Bismuth ore)



Sources

यत्र जातौ नागवङ्गौः चपलस्तत्र जायते ।
(Bri. Ras. Raj Sun.)

Where Naga (Lead) and Vanga (Tin) are found Chapala is found there. It is available in Bolivia, England and Canada. Metalic Bismuth is obtained from native Bismuth and Bisuthinite (Bi2S3). In the Rasa text Naga Sambhuta Chapala and Vanga Sambhuta Chapala is described.

त्रिंशत्पलमितं नागं भानुदुग्धेन मर्दितम् ।
विमर्द्य पुटयेत्तावद्यावत्कर्षावशेषितम् ॥
न तत्पुटसहस्त्रेण क्षयमायाति सर्वथा ।
चपलोऽयं समादिष्टो वार्तिकैर्नागसम्भवः ॥
(R.R.S. 8/41-42)

30 Pala of Naga is levigated with Arka Ksheera and subjected to Puta. The Puta is repeated till when one Karsha of Naga is left. This Naga dose not decayed by giving thousands of Puta. This is Naga Sambhuta Chapala. By doing the same procedure by taking Vanga, the Vanga Sambhuta Chapala is obtained.

Types

Rasa Ratna Samuchchaya has given its four variety-

1. Gaura (Bismuth oxide)
2. Shweta (Native Bismuth)
3. Aruna (Bismuth sulphide or Iron oxide)
4. Krishna (Bismuth sulphide)

Rasa Kamdhenu has given six types-

1. Svarna Chapala
2. Tara Chapala
3. Tamra Chapala
4. Tikshna Chapala
5. Naga Chapala
6. Vanga Chapala.

Grahya Lakshana of Chapala

चपलः स्फटिकच्छायः षडस्त्रः स्निग्धको गुरुः ।
(R.R.S. 2/115)

Which is white as Sphatika, having six edges and smooth and heavy is considered as best.

Chapala Shodhana

जम्बीर कर्कोटकशृङ्गबेरर्विभावनाभिश्चपलस्य शुद्धिः ॥
(R.R.S. 2/147)

Chapala powder is given Bhavana of Jambira, Karkota or Adraka Swarasa for seven times each.

Marana

चपलेन समः सूतो निर्गुण्डी रस मर्दितः ।
पाचितो बालुकायन्त्रे रक्त भस्म प्रजायते ॥
(R. Sam. Sho. Mar. Pra. 222)

Chapala is ground with equal part of Parada by adding Nirgundi Rasa then it is subjected to heating by Valuka Yantra, its Red coloured Bhasma is prepared.

Properties

चपलो लेखनः स्निग्धो देहलोहकरो मतः ।
रसराजसहायः स्यात्तिक्तोष्णमधुरो मतः ॥
(R.R.S. 2/144)

Chapala acts as Lekhana, it is Snigdha, works as Deha and Lohakara, enhances property of Parada. It is Tikta, Ushna and Madhura.

Ashuddha Chapala Sevanjanya Vyadhi

Ashuddha Chapala causes Manyastambha, Bhrama, Visphota, Daha, Pradara etc.

Dosha Shanti Upaya

Drinking of milk with sugar (Ras. Sam. Sho. Mar. 229-230)

Yoga

1. Chapala Rasa (Ist)
2. Chapala Rasa (IInd)
3. Chapala Baddha Rasa

Research updates

Safety study done on Calx of Bismuth and Selenium according to OECD guidelines has shown that Bismuth calx have shown considerable change in histopathology reports while fewer changes in selenium clax. The Chapala Bhasma prepared by Bismuth and Selenium was nontoxic while selenium clax showed more safety profile than Bismuth clax.

Rasaka (zinc carbonate)

Synonyms

गोभद्रो रसकस्तुत्थः क्षितिकिट्टो रसोद्भवः।
खर्परो नेत्ररोगारी रीतिकृत्ताम्ररंजकः॥
(Rasarnava 7/37)

Gobhadra, Rasaka, Tuttha, Kshitikitta, Rasodbhav, Kharpara, Netra Rogani, Ritikrita, Tamra Ranjaka.

Mineralogical Identification (Smithsonite)

Colour	- Yellow, White, Grey etc.
Cleavage	- Perfect
Tenacity	- Brittle
Lusture	- Vitreous may be pearly
Fracture	- Uneven
Streak	- White
Hardness	- 4.5
Specific Gravity	- 4.4 to 4.5

Sources

Zinc ore are found in two types of deposits. Primary zinc ores are found in the form of thin vein that are also known as Rakes. Secondary ores are formed as a result of weathering of primary ore. The most common is ZnCO3 calamine or smith sonite. In India it is found in Jharkhand, Punjab, Rajasthan. etc.

Types

According to Rasarnava

मृत्तिका गुड पाषाण भेदतो रसकस्त्रिधा।
पीतस्तु मृत्तिकाकारो मृत्तिकारसको वरः॥
क्षीयते नापि बह्निस्थः सत्त्वरूपो महाबलः॥
(Rasar. 7/28-29)

1. Mrittika (calamine)-Superior to all
2. Gudabaha (zincite)
3. Pashanabha (zinc blande)

Mrittika is of yellow colour and it does not decay on fire and it is superior amongst all. Having this property it is compared with ZnO. Gudabha is compared as ZnS while Pashanabha as ZnCO3.

According to Rasa Ratna Samuchchaya

रसको द्विविधः प्रोक्तो दर्दुरः कारवेल्लकः।
सदलो दर्दुरः प्रोक्तो निर्दलः कारवेल्लकः॥
सत्वपाते शुभः पूर्वो द्वितीयश्चौषधादिषु॥
(R.R.S. 2/149-50)

1. Dardura (calamine)- Sadala (Having layers or Lemileas)
2. Karvellaka (smithsonite)- Nirdala (Without layers)

Dardura is good for the Satvapatana while Karvellaka should be used for medicinal purposes. Both of these are $ZnCO_3$. Dardura is compared to Calamine while Karvellaka as Smithsonite.

रसक स्तुत्थ भेदः स्यात्खर्परं चापितृत्स्मृतम्।
ये गुणास्तुत्थके प्रोक्तास्ते गुणा रसके स्मृताः॥
(A.P. 2/276)

Ayurveda Prakash has considered Rasaka as variety of Tuttha.

Grahya Lakshana

For medicinal purpose Karvellaka variety while for Satvapatana Dardura should be taken.

Rasaka Shodhana

कटुकालबुनिर्यास आलोड्य रसकं पचेत्।
शुद्धं दोषविनिर्मुक्तं पीतवर्णं च जायते॥
(R.R.S. 2/154)

By doing Pachana in the Swarasa of Katu Alabu it become Shodhita with Pita Varna.

नृमूत्रे वाऽश्वमूत्रे वा तक्रे वा काञ्जिकेऽथवा।
प्रताप्य मज्जितं सम्यक् खर्परं परिशुद्धयति॥
(R.R.S. 2/156)

Kharpara is being heated up to red hot then it is dipped into Nara Mutra or Ashva Mutra or Takra or Kanji it becomes Shodhita.

Rasaka Marana

खर्परं पारदेनैव चूर्णयित्वा दिनं पचेत्।
बालुका यन्त्र मध्यस्थं शोणं भस्म प्रजायते॥
(A.P. 2/289)

Equal parts of Kharpara and Parada is taken and Paka for one day is done by using Baluka Yantra its red coloured Bhasma is prepared.

Probable Chemical Changes

Study done by H.S. Subha et al. shows that the percentage of Zinc in case of $ZnCO_3$ is 48-95%, 47.26% and 53.95% in Ashuddha, Shodhita and Bhasma respectively while in case of ZnO it was 85.38%, 86.10% and 69.5% in Ashuddha, Shodhita and Bhasma respectively.

Properties

रसकः सर्वमेहघ्नः कफ पित्त विनाशनः।
नेत्ररोगक्षयघ्नश्च लोहपारद रञ्जनः॥
(R.R.S. 2/151)

Rasaka is Sarva Mehaghna, Kapha Pitta Nashaka, Netra Roga, Nashaka and Lauha Parada Ranjana.

Dose

गुञ्जार्द्धतः समारभ्य गुञ्जाद्वितय संमिता।
खर्परस्य मता मात्रा रोगापनयनक्षमा॥
(R.T. 21/197)

1/2 Ratti to 2 Ratti is used according to Bala and Kala.

Ashuddha Kharpara Sevanjanya Vikara

अशुद्ध खर्परः कुर्याद्वान्तिं भ्रान्तिं विशेषतः।
तस्माच्छोध्यः प्रयत्नेन यावद्वान्तिविवर्जितः॥
(A.P 2/283)

When it is used in Ashuddha form it causes Vanti and Bhranti. So, it should be used after proper Shodhana.

Shanti Upaya

रसक निषेवणतो यदि रोगाः प्रादुर्भवन्ति मनुजानाम्।
तेनाशमाप्नुवन्ति पीतं गोमूत्रसप्ताहात्॥
(Vr. R. Raj. Su. Ras. p 122)

Gomutra should be administered for one week in the disease arriving from Rasaka intake.

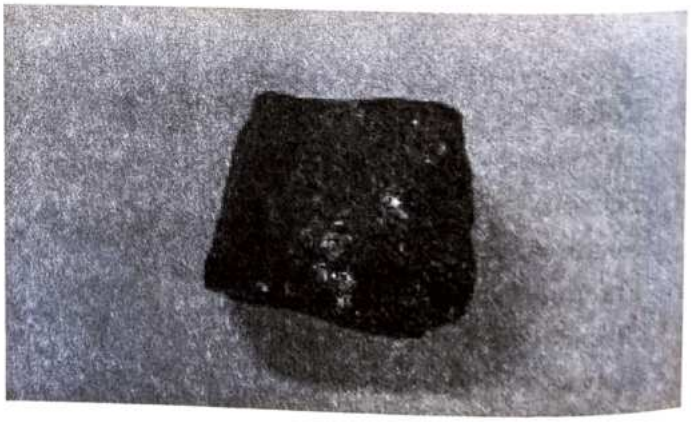
Yoga

1. Lakshmi Vilas Rasa
2. Pradaranta Rasa
3. Kasturi Bhairava Rasa
4. Vasant Malti Rasa
5. Laghu Malini Vasant Rasa

Research updates

Rasaka Bhasma prepared with $ZnCO_3$ shows better antimicrobial result than Rasaka Bhasma prepared out of ZnO.

5. Anjana



सौवीरमञ्जनं प्रोक्तं रसाञ्जनमतः परम्।
स्रोतोऽञ्जनं तदन्यच्च पुष्पाञ्जनकमेव च।
नीलाञ्जनं च.....॥
(R.R.S. 3/98)

1. Sauveeranjana
2. Rasanjana
3. Srotoanjana
4. Pushpanjana
5. Neelanjana
6. Kullatthanjana (Ayurved Prakash)

Modern comparison of these is as follows :

1. Sauveeranjana- Sb_2S_3 (According to Aacharya DA Kulkarni ji)
   PbS (As per Ayurvedic Pharmacopoeia of India)
2. Srotoanjana- Sb_2S_3 (As per A.P.I.)
3. Rasanjana- Now-a-days it is extract of Berbaris aristata.
4. Pushpanjana- ZnO
5. Neelanjana- Pbs (Galena)

1. Sauveeranjana

Origin and Occurrence

सुवीरानदीभवं सौवीरम्-चक्रपाणि

It is found from Suveera River

Sauveeanjana is found from Metamorphic and Sedimentary rocks in the form of veins or lodes. In India it is found from Rajasthan, Andhra Pradesh, Gujarat, Orissa and West Bengal.

Mineralogical Identification

Nature	-	Usually lumps and heavy cubic crystals
Colour	-	Grey
Streak	-	Grey
Cleavage	-	Cubic
Fracture	-	Even
Lusture	-	Metallic
Tenacity	-	Brittle
Transparency	-	Opaque
Hardness	-	2 to 3
Specific Gravity	-	7 to 8

Synonyms

स्त्रोतोऽञ्जनकं ख्यातं सौवीरं तु सुवीरजम्।
कृष्णाञ्जनं तथा कालाञ्जनञ्चापि प्रकीर्तितम्॥
(R.T. 22/37)

Sauveer, Suveeraja, Krishnanjan and Kalanjana are synonyms of Sauveeranjana.

Grahya Lakshana

1. बाह्यतः खलु धूमाभं भगे त्वतिसमुज्जवलम्।
   घर्षे खलु मषीवर्ण सौवीराञ्जनमुच्यते॥
   (R.T. 22/39)

It looks Dhoomabha externally while on breaking it is more bright and lasts black line while on rubbing.

2. Srotanjana- मतं स्त्रोतोञ्जनं श्रेष्ठं विशुद्धं सिन्धुसम्भवम्- (Hemadri commentary)

Synonyms

स्त्रोतोऽञ्जनं तु स्त्रोतोजं यामुनेयञ्च यामुनम्।
नीलाञ्जनं तदेवोक्तं कपोतंजनकाह्वयम्॥
(R.T. 22/36)

Srotoja, Yamuneyana, Yamunam, Neelanjana and Kapotanjana are Synonyms of Srotoanjana.

Grahya Lakshana

वल्मीक शिखराकारं भङ्गे नीलोत्पलद्युति।
घृष्टं तु गैरिकच्छायं स्त्रोतोजं लक्षयेद् धवम्॥
(R.R.S. 3/99)

It looks like shape of Balmika Shikhar, on breaking Shiney like Nilotpala and on rubbing gives red colour similar to Gairika.

3. Rasanjana

Rasanjana is considered to be a controversial drug. Ayurved Prakash has mentioned that it is two types. One is Shailaja i.e. procured from hills and other is Kritrima. Aacharya D.A. Kulkarni ji has mentioned that Rasanjana is yellow oxide of mercury which is a mineral obtained in nature in small quantities. Now a days the Kritrima variety is used that is prepared by the Ghana of Berbaris aristata. The Kitta obtained by heating of Riti (Brass) is also known as Rasanjana.

Synonyms

तार्क्ष्यजं तार्क्ष्यशैलं च रसगर्भं रसाञ्जनम्॥
(A.P. 2/234)

Tarkshya, Tarkshyshaila and Rasagarbha are synonyms.

Method of preparation

दार्वीक्वाथ समं क्षीरं पादपक्वं यदा घनम्।
तदा रसाञ्जनं ख्यातं तन्नेत्रयोः परमंहितम्॥
(A.P. 2/234)

Daruharidra Kwatha is mixed with one fourth part of Goat milk and Ghana is prepared by boiling. It is known as Rasanjana and good for Netra.

Rasanjana is yellow in colour. (R.R.S. 3/98)

4. Nilanjana

It is bluish and bright in colour, Snigdha and Guru. From modern point of view Nilanjana is Galena (Lead Sulphide). It is a widely distributed mineral and found in veins of silver and lead containing ignous rocks, as deposits in ground water surrounding sedimentary rocks. It is frequently associated with zinc and silver ores.

Synonyms

Shakra Bhumija, Suvarnghana, Lauha mardavkara

5. Pushpanjana

It is also a controversial material. The various opinion regarding it are as follows-

1. Anjana obtained from Pushpa (Kashmiri Honey procured from flowers).
2. Anjana prepared from Pushpa Kasisa.
3. According to Ayurved Prakash it is prepared from Riti Kitta.
4. Fulla Tuvari is also known as Pushpanjana.
5. Rasa Tarangini has described it as follows.

रीतिका द्रावण विधौ रीतिस्थं यशदं द्रुतम्।
समेत्यम्बर पीयूष योगेन सित चूर्णताम्॥
तदेवसितचूर्णन्तु पुष्पाञ्जनमुदीरितम्।
भस्त्राध्मातं पुष्पितं तु यशद वा तदाह्वयम्॥
(R.T. 22/49-50)

During the melting process of Riti (Brass), Zinc present in this reacts with atmosphere's oxygen and became powder of white colour. This white colour powder is known as Pushpanjana or only Yashad is when roasted in strong heat then its calyx (Pushpa) is formed it is known as Pushpanjana.

Synonyms

Ritigarbha, Ritipushpaka, Kusumanajana.

Grahya Lakshana

पुष्पाञ्जनं सितं चैव **(R.R.S. 3/100)**
Pushpanjana is white in colour

6. Kulatthanjana

It is black in colour.

Synonyms

कुकुलाली लोकहिता कुम्भकारी मलापहा।
(A.P. 2/240)

Kukulali, Lokhita, Kumbhhari, Malapha are synonyms.

Shodhana

अञ्जनानि विशुध्यन्ति भृङ्गराजनिजद्रवैः।
सूर्यावर्त्तादियोगेन शुद्धिमेति रसाञ्जनम्॥
(R.R.S. 3/105)

1. All Anjana become Shuddha when these are Bhavita with Bhringraja Swarasa.
2. For the Shodhana of Rasanjana Suryavartadi Yoga is used.

Probable Chemical Changes

Study on Shodhana of Srotanjana shows that it is effective to decreases the toxicity of Srotoanjana but there is no considerable change occurs in a chemical constituent of Ashodhita or Shodhita Srotoanjana.

Properties

सौवीरमञ्जनं धूम्रं रक्तपित्तहरं हिमम्।
विषहिध्मादिरोगघ्नं व्रण शोधन रोपणम्॥
(R.R.S. 3/100)

Sauveeranjana is Dhumra Varna, Raktapittahara, Hima, Visha, Hikka Roghana and

Varna Shodhana and Ropaka.

रसाञ्जनञ्च पीताभं विषवक्त्रगदापहम् ।
श्वासहिध्मापहं वर्ण्यं वातपित्तास्त्रनाशनम् ॥
(R.R.S. 3/101)

Rasanjana is Pita Varna, Visha Dosha and Mukha Roga Nashaka, Hikka, Shwasa Roga Nashaka, Varnya and Pacifies Vata, Pitta and Rakta Roga.

स्त्रोतोऽञ्जनं हिमं स्निग्धं कषायं स्वादु लेखनम् ।
नेत्र्यं हिध्माविषच्छर्दिकफपित्तास्त्ररोगनुत् ॥
(R.R.S. 3/102)

Srotoanjana is Hima, Snighdha, Kashaya, Madhura, Lekhana. It is good for Netra, Hikka and Shwasa Nashaka and mitigates Kapha, Pitta and Rakta Roga.

पुष्पाञ्जनं सितं स्निग्धं हिमं सर्वाक्षिरोगनुत् ।
अतिदुर्धरहिध्माघ्नं विष ज्वरगदापहम् ॥
(R.R.S. 3/103)

Pushpanjana is white in colour, Snigdha, Hima, Sarvakshi Rognuta, and mitigates Ati Durdhar Hikka. Visha and Jwara.

नीलाञ्जनं गुरु स्निग्धं नेत्र्यं दोषत्रयापहम् ।
रसायनं सुवर्णघ्नं लोहमार्दव कारकम् ॥
(R.R.S. 3/104)

Nilanjana is Guru, Snigdha, Netrya, pacifies all three Doshas. It is Rasayana, Suvaranghana and Lauha Mardavakara.

कुलित्था दृक्प्रसादा च चक्षुष्या च कुलित्थका ।
(A.P. 2/240)

Kulttha is Drishiprasadaka and Chakshyshya.

Dose- गुञ्जार्धतः समारभ्य गुञ्जैकामितमञ्जनम् ।
दिनद्वयं त्रयं वापि प्रयुञ्जीत भिषग्वरः ॥
(R.T. 22/47)

1/2 Ratti to 1 Ratti for 2 or 3 days (Sauveer and Srotoanjana)

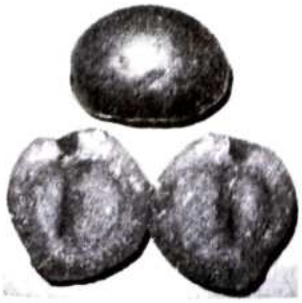
Yoga-

Sauveeranjana	Srotoanjana	Nilanjana	Rasanjana
Timirhar Anjana	Navangvatika	Vadvanal Rasa	Pushpanjana
Tuhinanjana	Tamradi varti	Shulvadi Varti	Piyushvalli Rasa
Anjan Tritaya	Anjan Tritaya	Rasendradi Varti	Patranasava
Suryanjana	Bhoot bhairava Rasa	Shadang Varti	Chandandi Churna
Sauveeranja Churna	-	Garunanjana	Prameha mudgar Rasa

Research updates

Analytical study on Rasanjana shows that it is having loss on drying 6.0%, ash value 7.2% acid insoluble ash 55.1% alcohol soluble extractive value 15% and water-soluble extractive value 18.2%.

Kankustha (Garcinia morella)



Synonyms

कङ्कुष्ठं काक कुष्ठं वराङ्गं कोलबालुकम् ॥
(A.P 2/315)

Kankushtha, Kakakushtha, Varanga and Kolabaluka.

Sources

हिमवत्पादशिखरे कङ्कुष्ठमुपजायते ।
(R.R.S. 3/109)

Kamkushtha is found at the base of high peaks of mountains of Himalaya.

Since ancient times Kankushtha is a controversial drug. Various opinion regarding it are as follows:

1. According to Bhaluki it is an ore of Tin mineral.
2. As per Rasarnava it is bright red in colour like Vidruma (Coral).
3. According to Dalhana it is Kanchan Ksheeri or Svarn Ksheeri (Dalhana commentary Su.Chi. 38/29-30).
4. According to Adhamalla it is Svarnksheeri (jÚeg#eerj mesngC[Fefle ÿeleerles)
5. Aacharya Yadav ji has considered it as Gambose or Revand Chini
6. Pandit Shaligram has accepted as Mriddarshringa.
7. Rasa Ratna Samuchchaya has described it as follows.

केचिद्वदन्ति कङ्कुण्ठं सद्योजातस्य दन्तिनः ।
वर्चश्च..... ॥
कतिचित्तेजिवाहानां नालं कङ्कुष्ठ संज्ञकम् ॥
(R.R.S. 3/111-12)

Some scholars say that it is a faecal matter of newly born elephant child. Other told that it is a part of umbilicus of a newly born horse child.

Now a days it is taken as secretion of Tamal tree or Mysore Gambose tree (Garcinia morella) which after some times from its procurement gets solidified and became Churna like. It is yellow in colour and possess Virechana property.

Types

तत्रैकं नलिकाख्यं हि तदन्यद्रेणुकं मतम् ।
(Rasa. Chu. 11/69)

It is of two types :

1. Nalikakhya- Pita, Guru, Snigdha. It is superior one.
2. Renuka- Shyamala, Laghu.

Grahya Lakshana

पीतप्रभं गुरु स्निग्धं श्रेष्ठं कङ्कुष्ठमादिमम् ।
श्यामपीतं लघु व्यक्तसत्त्वं नेष्टं हि रेणुकम् ॥
(R.R.S. 3/110)

Nalika is superior Kankushta having Pita Varna, Guru and Snigdha. While Renuka is Shyam, Pita, Laghu and Nihsatva it is not good.

Shodhana

कङ्कुष्ठं शुद्धिमायाति त्रिधा शुण्ठयम्बु भावितम् ।
(R.R.S. 3/114)

By giving three Bhavana of Shunthi Ambu it become Shuddha.

Properties

कङ्कुष्ठ तिक्त कटुकं वीर्योष्ण चातिरेचन् ।
(R.R.S. 3/113)

It is Tikta, Katu, Ushna Virya and Atirechaka.

Dose- भजेदेनं विरेकार्थे ग्राहिभिर्यवमात्रया ।
(R.R.S. 3/115)

One Yava Matra is used for the purpose of Virechana.

Vikar Shanti Upaya

बर्बूरिमूलिकाक्वाथो जीरसौभाग्यकं समम् ।
कङ्कुष्ठविषनाशाय भूयो भूयः पिबेन्नरः ॥
(R.R.S. 3/117)

Baboolmula Kwatha with Jeeraka and Tankana should be administered for many times.

Yoga

1. Dhanvantari Rasa
2. Mrita Sanjivana Rasa
3. Shothodariri Rasa
4. Udavarthara Ghrita
5. Sarveshwara Parpati

Research updates

Study on G. Morella show that it is having different secondary metabolites like Xanthones, benzophenones, flavonoids, phenolic acids, organic acids and terpenoids obtained from different part. These are having antioxidant, hepatoprotective, anti-cancer, anti-inflammatory, antimicrobial and larvicidal properties.

Agnijara (Ambergris)

Sources

It is obtained from sea shore of Mannar, Africa, Lakshadweep and Nikobar islands.

Description of Agnijara

समुद्रेणाग्निनक्रस्य जरायुर्बहिरुज्झितः ।
संशुष्को भानुतापेन सोऽग्निजार इति स्मृतः ॥
(R.R.S. 3/135)

When the Jarayu of fetus of Agninakra, a sea animal, is dried due to sun rays and taken to sea shore through sea waves is termed as Agnijara.

According to modern view it is dried faecal matter found in the intestine of whale fish. Which comes out from the intestine of dead whole fish after some times. Because it is very light so it floats on sea water and it is dried by sunrays then it is known as Ambar.

Grahya Lakshana

जाराभं दहति स्पर्शात्पिच्छिलं सागरोत्प्लवम् ।
जरायुस्तच्चतुर्वर्णं श्रेष्ठं तेषु सलोहितम् ॥
(An.Kan.Kri. 1/238)

It is smooth in touch, red in colour and floats on sea water.

Shodhana

यदब्धिक्षार संशुद्धस्तस्माच्छुद्धिर्न दीष्यते ॥
(R.R.S. 3/135)

Because it floats in the alkaline sea water so there is no need of Shodhana

Properties

अग्निजारास्त्रिदोषघ्नो धनुर्वातादिवातनुत् ।
वर्धनो रसवीर्यस्य दीपनो जारणस्तथा ॥
(R.R.S. 3/136)

It is Tridoshaghana, Dhanurvata Nashaka, increase potency of Parada. It is Deepana and have Jarana property.

Dosage- 120-360 mg mixed with ghee, butter and honey.

Yoga

1. Bhrihat Vata Chintamani Rasa
2. Jawahar Mohra Vati
3. Dhatri Rasayana
4. Vadvanal Rasa
5. Chintamani Rasa

Research updates

Ambergris occurs one in 100 sperm whales. It occurs in the rectum of whale but neither causes nor betrays diseases. It has been prized for over a thousand years as medicine condiment, aphrodisiac or perfume. Ambergris taken fresh from whale's rectum has a faecal smell but when it is dried out and matured and samples of good quality acquire a delicious and subtle fragance. It contains Ambreine ($C_{10}H_{52}O$) 25-40%, epi-coprosterol, free and esterified 30 to 40%, ketones as 6-8%.[Robert clarke, the origin of Ambergris, LAJAM 5(1):7-21 June 2006].

Giri Sindura (Red oxide of Hg)

Synonyms

सिन्दूरं गिरिसिन्दूरं महिलाभाल भूषणम् ।
गणेश, भूषणश्चैव तथा श्रङ्गार भूषणम् ॥
(R.T. 21/148)

Sidura, Giri sindura, Mahila Bhal Bhushana,

Ganesh bhushana and Shringarbhushana are synonyms.

Mineralogical Identification- (HgO)

Crystals	-	Orthorhombic
Colour	-	Deep red, Brounish red to brwown
Cleavage	-	Perfect
Tenacity	-	Sectile
Streak	-	Yellow-brown
Lustre	-	Vitreous, Sub-adamantine
Hardness	-	1.5 to 2

Sources

महागिरिषु चाल्पीयः पाषाणन्तः स्थितो रसः।
(R.R.S. 3/137)

It is found in between the rocks of big mountains which may be a mercury oxide compound known as Giri Sidura. ''Montraodite'' the mineral of mercury corelated with it.

Types

Rasa Jala Nidhi has said its two types :

1. Girisindura (Svabhavaja)- Red or orange coloured dry powder obtained naturally in smaller quantity on selected mountain peaks. Chemically it is identified as Mercuric Oxide (HgO).
2. Naga sindoora (Kritrima)- It is a compound of leaf found in india. Chemically Identified as Lead Oxide (PbO).

Grahya Lakshana

शुष्कशोणः स निर्दिष्टो गिरि सिन्दूर संज्ञया॥
(R.R.S. 3/137)

It is red in colour. The Girisindura, which possesses very fine (red or orange coloured coloured dry mercuric powder) particles that are Snigdha, Guru (heavy), Shiny, Soft and clean; such a sample is considered fit and selected for pharmaceutical purposes.

Shodhana

दुग्धाम्लयोगतस्तस्य विशुद्धिर्गदिता बुधैः।
(A.P. 4/90)

Dugdha and Amal Dravya are used for Shodhana of Giri Sindura.

Probable Chemical Changes

HgO decomposes on exposure to light on or heating above 500^0C. Heating produces highly toxic mercury fumes and oxygen.

Properties

त्रिदोषशमनं भेदि रसबन्धनमग्रिमम्।
देहलोहकरं नेत्र्यं गिरिसिन्दूरमीरितम्॥
(R.R.S. 3/138)

It acts as Tridosha Shamana, Bhedi. Netrya and Deha Lohakara. It is superior in Rasa Bandhana.

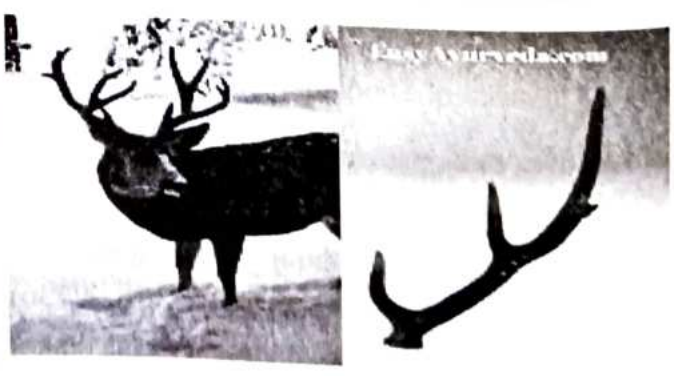
Yoga

1. Sindooradya Malhara
2. Gandhakadya Malhara
3. Jeerkadya Taila
4. Sindooradya Taila

Research updates

Giri Sindura chemically identified as Mercuric oxide (HgO). It is naturally available in mountains containing mercury ores, whereas lead oxide (PbO) may be considered as Naga Sindura is prepared artificially. Mercuric oxide is a toxic substance, which can be absorbed into the body by inhalation of its aerosol through the skin and by ingestion.

Mriddara Shringa (Litharge)



Mriddara Shringa as name suggests it is horn of an animal called Krishna Mriga (deer antler). It is one of the Sudha Varga Dravyas.

Synonyms

मृद्दारशृङ्गकञ्चैवं मतं बोदारशृङ्गकम्।
मुर्दाशङ्खं तथा मुद्रशङ्खकञ्च निगद्यते॥
(R.T. 21/165)

Mriddarshringa, Bodarshringa, Murdashankha and Mudrashankha are the synonyms.

Mineralogical Identification- (PbO)

Lustre	-	Greasy, Dull
Clevage	-	Distinct, Good
Diaphaneity	-	Transparent
Hardness	-	2
Specific Gravity	-	9.5 to 9.9

Sources

सदलं पीतवर्णं च भवेद्गुर्जरमण्डले।
अर्बुदस्य गिरेः पार्श्वे जातं मृद्दारशृङ्गकम॥
(R.R.S. 3/145)

It occurs in Gujarata near Arbuda Giri (Aravali mountains). Litharge is formed as a result of oxidation of Lead while it also occurs naturally in native form in the mines.

Types

बोदारशृङ्गकं प्रोक्तं द्विविधं पीतपाण्डुरम्।
सदलं निर्दलं.....॥
(A.P. 2/343)

It is of two types :

1. Pita and Pandu Varna
2. Sadala and Nirdala

Sadala and Pita varna is superior.

Grahya Lakshana

कीटानुपहतं दीर्घं भाराढ्यं सुदृढं तथा।
अनेक श्रृङ्गसंयुक्तं मृगश्रृङ्गं वरं मतम्॥
(R.T.12/104)

Mrigashringa which is not infested with worms, which is Dirgha (long), Bhara (heavy), Sudrudha (strong) and Aneka Shringa Samyuktam (having multiple branches), is said to be good.

Shodhana

मृद्दारशृङ्गमानीय कुट्टयेत् खल्व मध्यगम्।
प्रस्तरांशं परित्यज्य पेषयेदतियत्नतः॥
वस्त्रपूतं ततः कृत्तवा पुनः सुविमलाम्भसा।
पेषयेत्पक्षमेकं तु ततो घर्मे विशोषयेत्॥
मृद्दारशृङ्गकं काममेतद्विधविशोधितम्।
(R.T. 21/167-343)

Mriddara Shringa is ground in a Khalva Yantra and stones are picked and removed. Then it is filtered through cotton cloth and Mardana is done by taking water for a period of fifteen days. Now it is dried in Sunlight. By doing so Mriddara Shringa becomes Shuddha.

Marana

मृगश्रृङ्गं समादाय करपत्रेण कर्तयेत्।
खण्डशः कारयित्वा च त्वङ्क्षारान्नौ दहेत्ततः॥
सुदग्धञ्चाथ विज्ञाय खल्वे सञ्चूर्णयेग्भिषक्।
रविदुग्धेन सम्पेष्य चक्रिकाः कारयेत्ततः॥
शरावसम्पुटान्तःस्थं पुटेत्तीव्राग्निना भिषक्।
त्रिवारं पुटनादेणविषाणां मृतिमाप्नुयात्॥
(R.T. 12/105 - 107)

Mrigashringa is cut into small pieces, burnt in open air. After cooling it should be made into fine powder using a mortar. Then it should be ground with latex of Calotropis gigantea (Arka Ksheera) and Chakrikas (discs) are prepared. After drying discs should be sealed in mud saucers and subjected to Sharava puta for 3 times. Grinding with Arka Ksheera is repeated each time. Finally white colored Mrigashringa Bhasma is obtained.

Probable Chemical Changes- When heat is applied over the lead oxide it changes it colour to yellow. This yellow-coloured lead oxide is naturally unstable and as the temperature falls down it again changes into its stable form which is red coloured.

Dosage- 1-2 Ratti (125- 250mg)

Properties

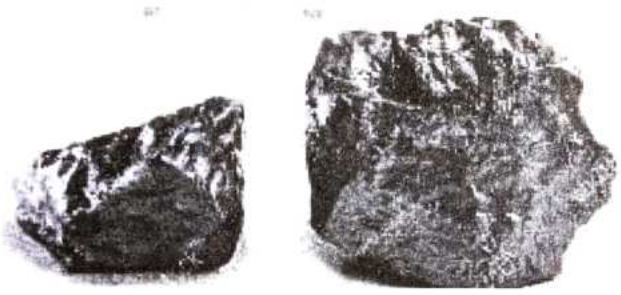
सीससत्त्वं गुह्यश्लेष्मशमनं पुङ्गदापहम्।
रसबन्धनमुत्कृष्टं केशरञ्जनमुत्तमम्॥
(R.R.S. 3/146)

It is Guru, Kapha Shamaka, Upadams Nashaka, Kesh Ranjaka and very good for Rasa Bandhana.

Yoga

1. Mriddara Bhasma Yoga (Pakardi Rasa Sh. 3229 Rs. Yo. Sa. II Part)
2. Pramehari Rasa
3. Manasamitra Vataka
4. Jauhara Aatshaka

Kamsya (Bronze)



Synonyms

1. कांसीयं कांस्यकं कांस्यं घोषपुष्पञ्च घोषकम्।
घोषो घोषं बह्निलोहं तदेव परिकीर्तितम्॥
(R.T. 22/21)
2. ताम्रत्रपुजमाख्यातं कांस्यं घोषं स कंसकम्।
(A.P. 4/62)

Tamra Tapuja, Ghosha, Kamsa, Kasiya, Kamsyaka, Ghoshopushpa, Ghoshaka, Ghosho, Vahni Loha are synonyms of Kamsya.

Sources

अष्टभाग ताम्रेण द्विभागखुरकेण च।
विद्रुतेन भवेत्कांस्यं तत्सौराष्ट्र भवं शुभम्॥
(R.R.S. 5/205

Eight Parts of Tamra and 2 parts of Khuraka Vanga when melted together then the alloy formed is known as Kamsya. The Kamsya which is prepared or occurred in Saurashtra is of best quality. It is also known as Bell Metal or white copper.

Types

कांस्यं च द्विविधं प्रोक्तं पुष्पतैलिकभेदतः।
पुष्पश्चेततमं तत्र तैलिकं कपिशप्रभम्॥
(A.P. 4/65)

It is of two types-

1. Pushpa - White colour
2. Tailika - Kapish colour

Grahya Lakshana

तीक्ष्ण शब्दं मृदु स्निग्धमीषच्छ्यामलशुभकम्।
निर्मलं दाह रक्तं च षोढा कांस्यं प्रशस्यते॥
(R.R.S. 5/206)

The Kamsya having following six characters is supposed to best-

1. Tikshana Shabada (Having good sound on impact)
2. Mridu (Soft)
3. Snigdha (Smooth)
4. Ishata Shyamal Shubhra Varna (Colour blackish white)
5. Nirmal (Free from impurities)
6. Daha Rakta (Becomes red on heating)

Agrahya Lakshana

तत्पीतं दहने ताम्रं खरं रूक्षं घनासहम्।
मन्दनादं गतज्योतिः सप्तथा कांस्यमुत्सृजेत्॥
(R.R.S. 5/207)

The Kamsya having, yellow colour, becomes Tamra Varna on heating, Khara, Rukshha, Ghanasaham (Do not bear impact), Mandanada (Having low sound), Gata Jyoti (Do not have lustre) is of Agrahya quality.

Shodhana

तैले तने गवां मूत्रे ह्यारनाल कुलत्थजे।
क्रमान्निषेचयेत्तप्तं द्रावे द्रावे तु सप्तधा॥
स्वर्णदिलोह पत्राणां शुद्धिरेषां प्रशस्यते।
(R.R.S. 5/13)

Kamsya is being heated up to red hot then it is quenched into Taila, Takra, Gomutra, Aarnala and Kulattha Kwatha for seven times in each of the liquid. By doing this Kamsya become Shuddha.

सूक्ष्मपत्रीकृतं घोषपुष्पाह्वयं मूत्रपद्वन्वितं स्थालिकायां न्यसेत् । याम सम्पाचितं तीक्ष्ण तीक्ष्णाग्निना सर्वदोषोज्झितं जायते सत्वरम् ॥ (R.T. 22/27)

Kamsya Patra	- 1 Part
Cow's urine	- Q.S.
Saindhava Lavana	- Q.S.

Thin sheets of Kamsya are dipped in an earthen vessel containing mixture of Saindhava Lavana and Cow's urine. Then it is heated for 1 Yama. By doing this process Kamsya becomes free from all Doshas.

Marana

तनुपत्रीकृतं कांस्यं समगन्धसमन्वितम् ।
अर्कक्षीरेण सम्पेष्य शोषयेदातपे दृढ़म् ॥
सम्पुटस्थं ततः कृत्वा वारणाख्ये पुटे पुटेत् ।
एवं पुटत्रयात्कांस्यभस्म स्यात्सुमनोहरम् ॥
(R.T. 22/28-29)

Shuddha Kamsya Patra	- 1 Part
Gandhaka	- 1 Part
Arka Ksheera	- Q.S.

Kamsya Patra and Gandhaka are levigated with the help of Arka Ksheera and dried in Sunlight. Now Sharava Samputa is done and it is subjected to Gajaputa. By repeating the process for three times the Bhasma is prepared.

कांस्यं तुल्यं शिलागन्धयुतं कन्याम्बुपेषितम् ।
पुटेत् त्रिधैवं यत्नेन भस्म स्यात् कज्जलप्रभम् ॥
(R.T. 22/31)

Shuddha Kamsya	- 1 Part
Shuddha Manhshila	- 1 Part
Shuddha Gandhaka	- 1 Part
Kumari Svarasa	- Q.S.

Shuddha Kamsya is ground with Manashila and Gandhaka with the help of Kumari Swarasa. Now Sharava Samputa is done and Gajaputa is given. The process is repeated for three times the black colour Bhasma is prepared.

Probable Chemical Changes- Raw Kamsya has 78% copper and 22% of Tin while Samanya Shodhita contains 72% copper and 19.58% of Tin. Kamsya Bhasma contains 62.87% copper and tin as 14.25% (Prepared after 7 Puta).

Properties

घोषपुष्पं तु तुवरं तिक्तोष्णं लेखने हितम् ।
नेत्रप्रसादनं रूक्षं सरं च विशदं परम् ॥
(R.T. 22/32)

Kamsya Bhasma is Kashaya, Tikta, Ushna having Lekhana Guna, Netra Prasadaka, Ruksha sara and Vishada.

Dose- 1/2 to 1 Ratti

Yoga

1. Vata Vidhwansa Rasa
2. Keshya kesari Rasa (Brihata)
3. Lakshmivilas Rasa
4. Chintamani Rasa
5. Shadanana Rasa
6. Vatavidhwasana Rasa
7. Nityananda Rasa

Pittala (Brass)

Synonyms

पित्तलं त्वारकूटं स्यादारो रीतिश्च कथ्यते ।
राजरीतिर्ब्रह्मरीतिः कपिला पिङ्गलापि च ॥
रीतिरप्युपधातुः स्यात्ताम्रस्य यशदस्य च ॥
(A.P. 4/66-67)

Pittala, Aarkuta, Auro, Riti, Rajriti, Brahmariti,

Kapila, Pingala, Kapiloha, Pitaloha are the synonyms of Pittala.

Sources

When 2 parts of Tamra and 1 Part of Yashada is melted together then alloy is formed which is known as Pittala.

Types

रीतिका काकतुण्डी च द्विविधं पित्तलं भवेत्।
सन्ताप्य काञ्जिके क्षिप्ता ताम्राभा रीतिका मता।
एवं या जायते कृष्ण काकतुण्डीति सा मता॥
(R.R.S. 54/191-92)

Pittala is of two types- 1. Ritika
2. Kakatundi

Ritika- If Pittala variety that is heated and quenched into Kanji turns into Tamarabha colour then it is of Ritika variety.

Kakatundi- If it is heated and quenched into Kanji and turns to black colour then it is Kakatundi.

Grahya Lakshana

गुर्वी मृद्वी च पीताभा साराङ्गी ताडनक्षमा।
सुस्निग्धा मसृणाङ्गी च रीतिरेतादृशी शुभा॥
(R.R.S. 5/193)

Pittala having Guruvi (Heavy in weight), Mridu (Softness) Pitabha (Yellowish in colour), Sarangi (Bright), Tadan Kshama (Can bear heavy impact), Susnigdha (Smoothness), Mrisana is of best quality.

Agrahya Lakshana

पाण्डु पीता खरा रूक्षा बर्बरा ताडनाक्षमा।
पूतिगन्धा तथा लघ्वी रीतिर्नेष्टा रसादिषु॥
(R.R.S. 5/194)

The Pittala having Pandu Pita Varna (Whitish yellow), Khara (Rough), Ruksha, Barbara Tadan Kshama (Breaks on impact), Puti gandha (Having bad smell) and Laghu (Light in weight) is not suitable for Rasa Karma.

Shodhana

तैले तने गवां मूत्रे ह्यरनाल कुलत्थजे।
क्रमान्निषेचयेत्तप्तं द्रावे द्रावे तु सप्तधा॥
स्वर्णादिलोह पत्राणां शुद्धिरेषां प्रशस्यते।
(R.R.S. 5/13)

Pittala	-	1 Part
Taila	-	Q.S.
Takra	-	Q.S.
Gomutra	-	Q.S.
Kanji	-	Q.S.
Kulattha Kwatha	-	Q.S.

Pittala is heated up to red hot then it is quenched in each of liquid. The process is repeated for seven times.

तप्त्वा क्षिप्त्वा च निर्गुण्डी रसे श्यामारजोन्विते।
पञ्चवारेण संशुद्धिं रीतिरायातिनिश्चितम्॥
(R.R.S. 5/197)

1. Ashuddha Pittala-1 Part
2. Nirgundi Svarasa containing Haridra powder -Q.S.

Pittala is heated up to red hot then it is quenched into Nigundi Swarasa mixed with Haridra power. The process is repeated for five times. Pittala becomes definitely Shuddha.

Marana

निम्बूरसशिलागन्धवेष्टिता पुटिकाऽष्टधा।
रीतिरायाति भस्मत्वं ततो योज्या यथा यथम्॥
ताम्रवन्मारणं तस्याः कृत्वा सर्वत्र योजयेत्।
(R.R.S. 5/198-199)

Shuddha Pittala	-	1 Part
Shuddha Gandhaka	-	1 Part
Shuddha Manashila	-	1 Part
Nimbu Swarasa	-	Q.S.

Pittala is kept with equal part of Gandhaka and Mahashila and Bhavana of Nimbu Svarasa it given then it is subjected to Gaja puta. By repeating this process for eight times the Bhasma of Pittala is made.

The Pittala Bhasma can also be made by following the Puta process similar to that of Tamra.

Colour of Bhasma - Black colour (R.T. 22/11)

Probable Chemical Changes- XRD of Pittala Bhasma shows the presence of CuO having granular appearance and poly crystalline nature. SEM of Bhasma shows particles with change in morphology.

Properties

रीतिस्तिक्तरसा रूक्षा जन्तुघ्नी सास्रपित्तनुत्।
कृमिकुष्ठहरा योगात् सोष्णवीर्या च शीतला॥
(R.R.S. 5/195)

Ritika is Tikta Rasa, Ruksha, Kriminashaka, Rakta Pitta, Krimi Kushtha Nashak. Shita Virya and by combination with other drugs it becomes Ushna Virya.

काकतुण्डी गतस्नेहा तिक्तोष्ण कफपित्तनुत्।
यकृतप्लीहाहरा शीतवीर्या च परिकीर्तिता॥
(R.R.S. 5/196)

Kakatundi is Ruksha, Tikta, Ushna, Kapha Pitta Nashaka, Yakrit and Pliha Dosha Nashaka and Shita Virya.

Dose

पित्तलस्य योगस्तु रविलोहसमो मतः।
गुञ्जार्धतस्तु गुञ्जैकमिता मात्रा च युज्यते॥
(R.T. 22/18)

1/2 Ratti to 1 Ratti or it should be used as per Tamra.

Asamyaka Marita Pittala Dosha

विविधरोगचयं कुरुते भ्रमं गुदरुजह्यतिगेहरुजां गणम्।
विविधतापक्रमा तनुते तानावमृतमारकमाशु हि मृत्युदम्॥
(Ras. Raj. Sur. Mish. Dhatu Pra.)

It causes Bhrama, Arsha, Bhagandara, Jwara and even death when used Asamyaka Marita.

Yoga

1. Pittala Rasayana
2. Ratna Prabha Vati
3. Sarveshwara Parpati
4. Svarna Sindoora

Research updates

Depending upon ratio of Copper and Zinc, Brass can be of Alpha, Alpha-beta, Beta, Gamma and white Brass types. Anti-bacterial properties of brass have been observed for centuries particularly in marine environments while it prevents biofouling.

Vartaloha

Synonyms

पञ्चलोहं पञ्चरसं वर्तुलं भर्तमित्यपि।
(A.P. 4/83)

Pancha Loha, Pancha Rasa, Vartula and Bharta are the Synonyms of Vartaloha.

Sources

Varta Loha is prepared as a result of combination of following five Dhatus.

कांस्यार्करीतिलोहाऽहिजातं तद्वर्तलोहकम्।
(R.R.S. 5/212)

1. Kamsya
2. Arka (Tamra)
3. Riti (Pittala)
4. Loha
5. Ahi (Naga)

Shodhana

द्रुतमश्वजले क्षिप्तं वर्तलोहं विशुध्यति॥
(R.R.S. 5/215)

Varta Loha - 1 Part
Horse urine - Q.S.

By melting the Varta Loha then dipping into horse urine it becomes Shuddha.

Marana

म्रियते गन्धतालाभ्यां पुटितं वर्तलोहकम्।
तेषु तेष्विह योगेषु योजनीयं यथाविधि॥
(R.R.S. 5/216)

Shuddha Varta Loha - 1 Part
Shuddha Gandhaka - 1 Part
Shuddha Hartala - 1 Part

By giving Puta with Gandhaka and Hartala the

Bhasma of Varta Loha can be prepared that can be used in different formulation.

Properties

हिमाम्लं कटुकं रूक्षं कफपित्तविनाशनम्।
रुच्यं त्वच्यं कृमिघ्नं च नेत्र्यं मलविशोधनम्॥
तद्भाण्डे साधितं सर्वमन्नव्यञ्जनसूपकम्।
अम्लेन वर्जितं चापि दीपनं पाचनं हितम्॥
(R.R.S. 5/213-214)

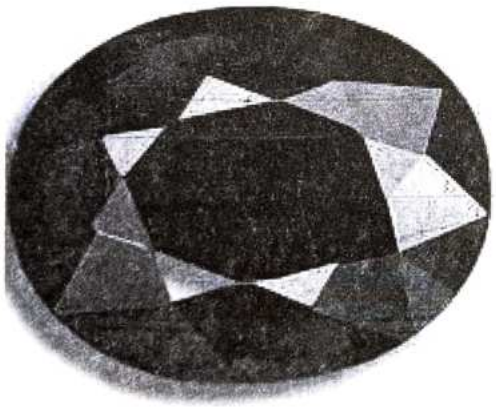
It is Sheeta Virya, Amla, Katu, Ruksha, Kapha Pitta Nashaka, Ruchikara, good for Twaka, Kriminashaka, Netrya and Mala Shodhana. All food items except Amala are Deepana and Pachana that are prepared in the vessel made up of Varta Loha.

Dose- 1/2 to 1 Ratti

Yoga

1. Sarveshwara Parpati

Manikya (Ruby)



Manikya is one among precious stones. The ruby is a pink to blood red coloured gemstone a variety of mineral Aluminium oxide.

Synonyms

माणिक्यं रङ्गमाणिक्यं पद्मरागसमाह्वयम्।
रविरत्नं शोणरत्नं कुरुविन्दञ्च लोहितम्॥
(R.T. 23/43)

Manikya, Ranga manikya, Padmaraga, Raviratna, Shonaratna, Kuruvinda and Lohita are synonyms of Manikya.

Mineralogical Identification

Colour	-	Red, may be brownish or purplish
Cleavage	-	No true cleavage
Fracture	-	Uneven or conchoidal
Luster	-	Vitreous
Streak	-	White
Hardness	-	9.0
Specific Gravity	-	4.0

Sources

It is found mainly in igneous or metamorphic rocks. Besides this it also occurs as a placer deposit in the river and sedimentary rocks as a result of weathering. Ruby, is a variety of mineral corundum having formula Al2O3 in which chromium is found in trace amount. Due to presence of chromium its colour is red. It is found in Myanmar, Srilanka and Karnataka and Orissa in India.

Types

माणिक्यं पद्मरागाख्य द्वितीयं नीलगन्धि च।
(R.R.S. 4/8)

It is of 2 types-

1. Padmaraga
2. Neelagandhi

Grahya Lakshana

कुशेशयदलच्छायं स्वच्छं स्निग्धं गुरु स्फुटम्।
वृत्तायतं समं गात्रं माणिक्य श्रेष्ठमुच्यते॥
(R.R.S. 4/9)

Kusheshaya Dal Chhaya (Similar to leaf of Red lotus in lusture) Svaccha (Free from impurities), Snigdha, Guru, Sphuta (Clear), Vritta (Round), Aayata (Rectangular) and Sama (even) having these characters Manikya is superior one.

नीलं गङ्गाम्बुसम्भूतं नीलगर्भारूणच्छवि।
पूर्वमाणिक्यवच्छ्रेष्ठं माणिक्यं नीलगन्धि तत्॥
(R.R.S. 4/10)

Manikya which is obtained from Ganga River, having red colour from outside and blue colour

inner side and other characters having to that of Padmaraga is supposed to best Neelagandhi.

Agrahya Lakshana

रन्ध्रकार्कश्यमालिन्यरौक्ष्यावैराद्यसंयुतम् ।
चिपिटं लघुवक्त्रं च माणिक्य दुष्टमष्टधा ॥
(R.R.S. 4/11)

Manikya having pores, Karkasya (Hard) Malina (Impurities), Ruksha (Rough in touch), Chipita (Flat) and Laghu Vaktra in Agrahya.

Shodhana

निम्बूकस्वरसेनेह दोलायन्त्रे विधानतः ।
यामैकं स्वेदितं कामं माणिक्यं शुद्धिमाप्नुयात् ॥
(R.T. 23/46)

Swedana is done in Dolayantra using any Amla Drava like Nimbu Rasa etc. for 3 hours Manikya becomes Shuddha.

Marana

1. Manikya - 1 Part
2. Suddha Manashila - 1 Part
3. Suddha Gandhaka - 1 Part
4. Suddha Haratala - 1 Part
5. Nimbu Swarasa - Q.S.

Manikya is ground well with Manashila, Haratala and Gandhaka by adding Nimbu Swarasa then Gajaput is given. The process is repeated for eight times.

Bhasma Varna

माणिक्यं म्रियते भस्म जायते पाण्डुरप्रभम् ।
(R.T. 23/53)

Manikya Bhasma colour is like Pandu Varna.

Probable Chemical Changes- In XRD study Ashodhita and Shodhita Manikya showed Al2O3 as Al2O3 and orthorhombic crystal system while Manikya Bhasma as Al2O3 and orthorhombic crystal system.

Properties

माणिक्यं दीपनं वृष्यं कफवातक्षयार्तिनुत् ।
भूतवेतालपापघ्नं कर्मजत्याधिनाशनम् ॥
(R.R.S. 4/12)

It is Deepana, Vrishaya, Kapha Vata Nashaka, Kshaya Nashaka, Bhoot. Betal, Papa Nashaka and Karmaj Vyadhi Nashaka.

Dose

आरभ्य गुञ्जापादांशात् गुञ्जार्द्धप्रमितं मृतम् ।
माणिक्यं योजयेद्धीमान् बलकालाद्यपेक्षया ॥
(R.T. 23/59)

1/4 Ratti to 1/2 Ratti according to Bala and Kala.

Manikya Pishti

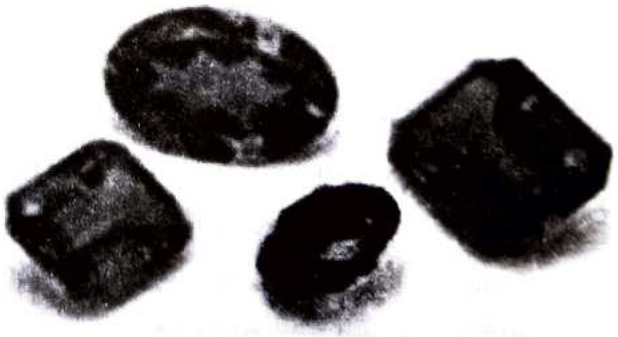
Manikya is levigated with Gulab Jala to make its very fine powder having pink colour. It is Manikya Pishti.

Yoga

1. Yakuti
2. Navaratna Raj Mriganya Rasa
3. Javahar Mohra Vati
4. Brahmi Vati
5. Ratnabhagottara Rasa

Research updates- Study done on Manikya Bhasma shows that the dual potential of its as a nano carrier to deliver the drugs and exerting cytotoxic effects against cancer cells.

Tarkshya (Emerald)



Tarkshya is a green gem which comes under Navaratnas. It calms Budha Graha. It compound of silica, beryllium and oxygen.

Synonyms

गारूत्मतं मरकतं तार्क्ष्यं गारूडसंज्ञकम् ।
बुधरत्नं रौहिणेय हरिद्रत्नश्च तन्मतम् ॥
(R.T. 23/104)

Garutmat, Markata, Tarkshya, Garuda, Buddha Ratna, Rauhineya and Haridratana are synonyms to Tarkshya.

Mineralogical Identification

Colour	- Green shades to colourless
Cleavage	- Imperfect
Fracture	- Conchoidal
Diaphancity	- Transparent to opaque
Streak	- White
Lustre	- Viterous
Hardness	- 7.5 to 8.0
Specific Gravity	- 2.76

Sources

Emerald occurs in sedimentary, igneous and metamorphic rocks. These are green coloured minerals and variety of Beryl having chemical composition Be3Al2 [SiO3]6. Emerald is found in Columbia, Brazil, Zimabbe and Jambia etc. Chemically it contains Beryllium, Aluminium, Oxygen and Silicon.

Types

According to colour it is of three types-

1. Harita
2. Neela
3. Shweta

Based on colour it is four types :

1. Brahmana Varna- like flower of Shirisha
2. Kshatriya Varna- Deep green colour
3. Vaishya Varna- Greenish with yellow tinge
4. Shudra Varna- Greyish tinge

Grahya Lakshana

हरिद्वर्णं गुरू स्निग्धं स्फुद्रश्मिचयं शुभम्।
मसृणं भासुरं ताक्ष्यं गात्रं सप्तगुणं स्मृतम्॥
(R.R.S. 4/20)

Harit Varna (Green colour), Guru (Heavy), Snigdha, Sphurad Rashmi (Diffracts rays), Shubha (Free from impurity), Mrisana, Bhasma (Bright) having there seven characters Tarkshya is of best quality.

Agrahya Lakshana

कपिलं कर्कशं नीलं पाण्डु कृष्णं मलान्वितम्।
चिपटं विकटं रूक्षं लघु ताक्ष्यं न शस्यते॥
(R.R.S. 4/21)

Kapil (Grey colour), Karkasha (Hard) Neela, Pandu, Krishna, Malanvita (Having impurities), Chipita (Flat), Vikata (Deform), Ruksha, and Laghu (Ligh in weight) having these characters Tarkshya is not good.

Shodhana

सुरभी पयसा यामं दोलायन्त्रे विधानतः।
विपाचितं मरकतं विशुद्धमति सुनिश्चितम्॥
(R.T. 23/107)

Ingredients-

1. Tarkshya - 1 Part
2. Go Dugdha - Q.S.

Swedana for one Yama is done in Dola yantra using Go-dugdha as liquid media Tarkshya become Shuddha.

Marana

माणिक्य मारणोद्दिष्टाविधिभ्यामतियत्नतः।
अष्टधा पुटितं ताक्ष्यं म्रियतेऽत्र न संशमः॥
(R.T. 23/108)

The Marana Process of Panna is similar to Mankiya. The Bhasma can be prepared by giving eight Puta.

The colour of Bhasma is white.

Properties

मृतं मरकतं बल्यं विषघ्नं बह्निदीपनम्।
ओजोविवर्द्धनं वृष्यं पाण्डुशोफनिषूदनम्॥
श्वासच्छर्दिप्रशमनं गुदजामयनाशनम्।
समाख्यातं विशेषेण सन्निपातनिवहणम्॥
(R.T. 23/109-10)

Panna Bhasma is Balya, Vishaghana, Agnideepana, Ojovardhana, Vrishya, Pandu, Shopa, Nashaka, Shwasa, Chhhardi Prashamaka and Arsha Nashaka.

Dose

आरम्भ गुञ्जापादांश गुञ्जैकप्रमितं परम्।
मृतं मरकतं युञ्जात बलकालाद्यपेक्षया॥
(R.T. 23/111)

1/4 Ratti to 1 Ratti according to Bala and Kala.

Markata Pishti- Markata is ground well with rose water till it becomes very fine powder.

Yoga

1. Ratna Bhagottara Rasa
2. Yakuti
3. Nava Ratna Rajmriganka Rasa
4. Maniparpati Rasa
5. Javahar mohra Vati

Research updates

Beryl is a beryllium aluminium silicate ($Be_3A_{l2}Si_6O_{18}$) formed from aluminium (81%), Silicon (27.7%) and oxygen (46.6%). Beryl becomes an emerald when there is enough chromium or vanadium, and sometimes iron to colour it a specific green colour. Emerald typically display two main colours, making it specifically dichroic. https://emeralds.com.

Pushparaga (Topaz)

Pushparaga is a Maharatna which belongs to Kuruvind category. It is a combination of Aluminium and sand.

Synonyms

पुष्पराजः पुष्परागः पीतरक्ताह्वयस्तथा।
गुरूरत्नं पीतमणिः स एव गुरूवल्लभः॥
(R.T. 23/87)

Pushpraja, Pushparaga, Pitarakta, Gururatna, Pitamani and Guruvallabha are synonyms of Pusharaga.

Mineralogical Identification

Colour	-	Yellow
Streak	-	Colourless
Luster	-	Vitreous
Tenacity	-	Brittle
Fracture	-	Irregular
Cleavage	-	Perfect
Hardness	-	8
Specific Gravity	-	3.4 to 3.6

Sources

It is mineral of Aluminium and Fluorine having chemical formula Al2SiO4 (F.OH) known as Aluminium fluosilicate. Topaz is found in igneous rocks as granite and rhyolite. It is found in South America, Russia, Afghanistan, Sri Lanka, Australia and Germany etc. countries.

Types

It is of following 2 types (According to Kapla Taru)

1. Padmaraga Vata
2. Markata Vata

Grahya Lakshana

पुष्परागो गुरूः स्निग्ध स्वच्छः स्थूलः समो मृदुः।
कर्णिकार प्रसूनाभ मसृणश्च शुभोऽष्टधा॥
(R.R.S. 4/23)

Pushparaga which is Guru (Heavy in weight), Snigdha, Svachchha (Free from impurities), Sthool (thick) Sama (Uniform) Mridu, Colour having to that of flower of Nerium and Mrishana (soft to touch) having these characters is of best quality.

Agrahya Lakshana

निष्प्रभं कर्कषं रूक्षं पीतश्यामं नतोन्नतम्।
कपिशं कपिलं पाण्डु पुष्परागं परित्यजेत्॥
(R.R.S. 4/24)

Nishprabha (Lustreless), Karkasha (hard), Ruksha (rough), Pita Shyam (yellowish brown

colour), Natonnata (Uneven), Kapish, Kapil and Pandu Varna (black, grey and yellow colour) should be avoided.

Shodhana

कुलत्थक्वथितोपेतैः काञ्जिकैः स्वेदितं समम्।
दोलायन्त्रे पुष्परागं यामैकेन विशुद्धयति॥
(R.T. 23/91)

Swedana of Pushparaga is done in Dolayantra for one Yama using mixture of Kulattha Kwatha and Kanji as liquid media. By this process Pushparaga becomes Shuddha.

Marana

माणिक्यमारणोद्दिष्टविधिभ्यामतियत्नतः ।
मारयेत्पुष्पराजरन्तु रसतन्त्रविचक्षणः॥
(R.T. 23/92)

As per Marana method of Manikya it is done.

Ingredients-

1. Shuddha Pushparaga - 1 Part
2. Shuddha Manashila - 1 Part
3. Shuddha Haratala - 1 Part
4. Shuddha Gandhaka - 1 Part
5. Nimba Rasa - Q.S.

Ingredients from 1 to 4 are ground with Nimbu Swarasa for seven days then Chakrika is made and dried in Sun rays. Now Sharava Samputa is done and Gajaputa is given. By repeating the process for eight times the Bhasma of Pushparaga is prepared of white colour.

Pushparaga Pishti- Pushparaga is levigated with rose water till it becomes very five powder.

Properties

पुष्पराजन्तु शिशिरं दीपनं पाचनं लघु।
(R.T. 23/93)

It is Laghu, Sheeta Virya Deepana and Pachana.

Dose-

आरम्भ गुञ्जापादांशाद् गुञ्जैकप्रमितं परम्।
सुमृतं पुष्पराजन्तु प्रयुञ्जीत भिषग्वरः॥
(R.T. 23/95)

Pushparaga in dosage of 1/4 Ratti to 1 Ratti is used

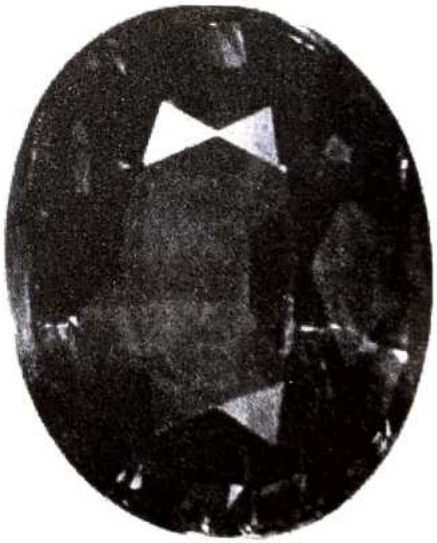
Yoga

1. Nava Ratna Raj Mriganka Rasa
2. Ratna Bhagottara Rasa
3. Maniparpati
4. Rakta Karandaka Rasa
5. Sarveshwara Parpati

Research updates

Chemical composition of Topaz contains Al (29.61%), Si (15.41%), Hydrogen (0.50%), Oxygen (43.02%) and fluorine (11.47%). Topaz has orthorhombic Dipyramidal crystal system. (https://webmineral.com).

Nilam (Sapphire)



Synonyms

नीलो नीलोपलो नीलं नीलरत्नं सुनीलकम्।
महानीलञ्च नीलाश्म शनिरत्नञ्च कीर्तितम्॥
(R.T. 23/96)

Neela, Neelopalo, Neela. Neelaratna, Suneelakam, Maheneela, Neelashma and Shani Ratna are synonyms to Neelam.

Neelam or Nilam is precious gem stone categorized under Navaratna. It is a compound of Aluminium and oxygen with traces of cobalt. It calms Shani Graha.

Mineralogical Identification

Colour	-	Typically blue
Cleavage	-	Poor
Lustre	-	Vitreous
Streak	-	Colourless
Fracture	-	Conchoidal
Hardness	-	9.0
Specific Gravity	-	3.98-4.06

Sources

It is a gem stone of corundum variety mineral having chemical formula aAl2O3. Besides Aluminium oxide it also contains Iron, Titianium, Chromium, Magnesium and Vanadium in small quantity. Neelama is found in sand and solid rock along with Ruby. In foreign countries it is found in Australia, Brazil, Kenya, Sri Lanka, Cambodia etc. In India it is found in Jammu and Kashmir and Vijayanagram. It's blue colour is due to presence of Titanic oxide and traces of Cobalt.

Types

जलनीलेन्द्रनीलञ्च शक्रनीलं तयोर्वरम्।
श्वैत्यगर्भितनीलाभं लघु तज्जलनीलकम्॥
काष्ण्यर्गर्भितनीलाभं सभारं शक्रनीलकम्।
(R.R.S. 4/49-50)

It is of two types-

1. **Jala Neela-** Whitish inside Blue and Light weight.
2. **Indra Neela-** Blackish inside blue and heavy weight-Superior

Grahya Lakshana

एकच्छायं गुरु स्निग्धं स्वच्छं पिण्डितविग्रहम।
मृदु मध्ये लसज्ज्योतिः सप्तथाः नीलमुत्तमम्॥
(R.R.S. 4/51)

Eka Chhaya (Uniform colour), Guru (Heavy) Snigdha (Smooth), Pindita vigraha (Round shaped), Mridu, Madhya Lassjjyoti (Bright inside mid), Svachchha (Free from impurities) having these seven qualities Neelam is of acceptable quality.

Agrahya Lakshana

रक्तार्द्ध विगच्छायं रूक्षं लघु च कोमलम्।
परिहेयं शौरिरत्नं मतं रत्नपरीक्षकैः॥
(R.T. 23/98)

Raktaardha (Half part is red colour) Vigatchhaya (Lustre less), Raksha, Laghu (Light weight), Komala (Soft) having these qualities it should not be accepted.

Uttama Neelam Examination

अस्त्यान चन्द्रिकास्यन्द सुन्दरीक्षीर पूरितम्।
यत्पात्रं रञ्जयत्याशु स जात्यो नील उच्यते॥
(A.P. 5/125)

In the light of full moon lady holding vessel full with milk if Neelamani is dipped into it and coloured the milk with its lustre then it is of superior quality.

Shodhana of Neelam

नीलीस्वरससंयुक्तं दोलायन्त्रे विधानतः।
यामैकं परियक्वन्तु नीलं शुद्धयति निश्चितम्॥
(R.T. 23/99)

Swedana of Neelam is done by means of Dolayantra using Neeli Swarasa for one Yama it becomes Shodhita.

Marana of Neelam

मणिक्यमारणोद्दिष्टविध्यिामतियत्नतः।
मारयेच्छनिरत्नं तु रसागमविशारदः॥
(R.T. 23/100)

Ingredients-

1. Shuddha Neelam	-	1 Part
2. Shuddha Manashila	-	1 Part
3. Shuddha Haratala	-	1 Part
4. Shuddha Gandhaka	-	1 Part
5. Lakucha Swarasa	-	Q.S

It is levigated with Lakucha Swarasa with Haratala, Manashila and Gandhaka and Chakrika is made. It is dried and kept in Sharava Samputa and Gajaputa is given. It is repeated for eight times.

Colour of Bhasma - White

Pishti- It is made with rose water. Levigation is done till it becomes very fine powder.

Properties

श्वासकासहरं वृष्य त्रिदोषघ्नं सुदीपनम्।
विषमज्वरदुर्नामपापघ्नं नीलमीरितम्॥
(R.R.S. 4/53)

It is Tridoshaghana, Deepana and is used in Shwasa, Kasa, Vishamjwara, Arsha. It is Vrishya and Papaghana.

Dose

गुञ्जाष्टमांश प्रमितात् गुञ्जार्द्धप्रमितं परम्।
सुमृतं नीलरत्नं तु प्राणाचार्यः प्रयोजयेत्॥
(R.T. 23/103)

1/8 Ratti to 1/2 Ratti is used after proper examination.

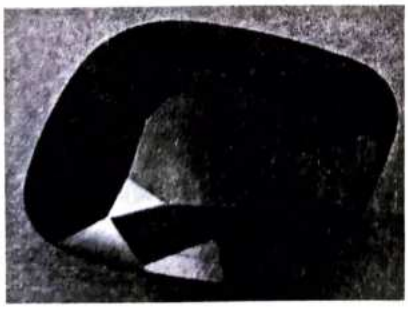
Yoga

1. Ratna Bhagottara Rasa
2. Rajamriganka Rasa
3. Maniparpati Rasa
4. Nava Ratna Rajmriganka Rasa
5. Sarveshwara Parpati

Research updates

Ruby and Sapphire both are gems of the mineral corundum. Both of these have same chemical composition as well as mineral structure. Trace amount of impurity determines its colour. The red colour or ruby is produced by the presence of chromium while trace amount of iron and titanium can produce a blue colour corundum know as Sapphire. (https://gelogy.com)

Gomeda (Zircon or Cinnamon stone)



Gomeda is a precious gem which belongs to Navaratna. Colour of Gomeda is similar to the fat of cow so called as Gomeda. It calms Rahu Graha.

Synonyms

गोमेदकञ्च गोमेदः पिङ्गस्फटिक इत्यपि।
गोमेदो राहुरत्नञ्च कीर्तितश्च तमोमणि॥
(R.T. 23/120)

Gomedaka, Gomeda, Pinga sphatika, Gomeda, Rahu Ratna and Tamomani are synonyms.

Nirukti

गोमेदः समरागत्वाद् गोमेदं रत्नमुच्यते।
(R.R.S. 4/54)

Because its colour is similar to Gomeda (Cow's fat) so it is termed as Gomeda.

Mineralogical Identification

Nature	-	Crystal
Colour	-	Reddish brown
Streak	-	White
Cleavage	-	Not present
Lustre	-	Vitreous to resinous
Tenacity	-	Brittle
Hardness	-	7.0 to 7.5
Specific Gravity	-	3.5 to 4.0

Sources

It is found in two forms 1. In Situ deposits and 2. In the places. In situ deposits occurs in Metamorphic rock in the form of schists and gneisses along with in other igneous rock. In the placers it is found as sediments of detrial residue. In situ Gomeda in India is found in Andhra Pradesh, Jharkhand, Rajasthan and Karnataka while placer deposits occurs in Kerala, Tamil Nadu and Orissa Gomeda contains aluminium and Silica. Khalva made up from it do not scraps easily.

Types

It is of following four types-

1. Shwetabha Pita
2. Raktabha Pita

3. Pita
4. Krishnabha Pita

Grahya Lakshana

सुस्वच्छ गोजलच्छायं स्वच्छं स्निग्धं समं गुरू।
निर्दलं मसृणं दीप्तं गोमेदं शुभमष्टधा॥
(R.R.S. 4/54)

Svachchha Gojala Chhaya (Colour of clean urine of cow), Svachchha, Snigdha (unctuous), Sama (Equal) Guru (heavy), Nirdala (having no layers), Mrishana (smooth) and Dipta (shining) having these eight characters is of good quality.

Agrahya Lakshana

विच्छायं लघु रूक्षाङ्गं चिपिटं पटलान्वितम्।
निष्प्रभं पीतकाचाभं गोमेदं च शुभावहम्॥
(R.R.S. 4/55)

Vicchaya (unsuitable color), Laghu (light), Rukshanga (dry), Chipita (flat), having Patala (layers), Nishaprabha (Lustreless), Pitakachabha (yellow glass colour) should not be accepted.

Shodhana

1. Swedana in Gorochana Kwatha it becomes Shuddha.
2. निम्बूकस्वरसेनेह दोलायन्त्रे विधानतः।
परिस्विन्नं तु यामैकं शुद्धिमायात्यनुत्तमाम्॥
(R.T. 23/123)

By doing Swedana in Dolayantra for one Yama using Nimbu Swarasa it becomes Shuddha.

Marana

माणिक्य मारणोद्दिष्टविधिभ्यामतियत्नतः।
अष्टबारं सुपुटितं गोमेदं मृतिमाप्नुयात्॥
(R.T. 23/124)

Gomeda is ground well with Manashila, Gandhaka and Haratala with help of Lakucha Swarasa and Chakrika is made. It is kept in Sharava Samputa and Gajaputa is given. The process is repeated for eight times Bhasma is prepared.

Colour of Bhasma - Kattha Varna

Pishti- It is prepared by levigating Gomeda with rose water till it becomes very fine powder

Properties

गोमेदकोऽम्ल उष्णाश्च वात प्रकोप विकारजित्।
(A.P. 5/116)

It is Amal Rasa, Ushna and pacifies Vata Prakopaka diseases.

Dose-

आरम्भ गुञ्जापादांशाद् गुञ्जैकप्रमितं मृतम्।
गोमेदं तु प्रयुञ्जीत बलकालाद्यपेक्षया॥
(R.T. 23/127)

Dosage of 1/4 Ratti to 1 Ratti after examining Bala and Kala.

Yoga

1. Nava Ratna Raj Mriganka Rasa
2. Ratnabhagottara Rasa
3. Sarveshwara Parpati

Research updates- Zircon is an orthosilicate and its structure consists of isolated SiO_4 tetrahedra and ZnO_8 do decahedra. Zircon has a stoichiometric composition of 67.2 wt%. ZnO_2 and 32.88 wt% SiO_2 and may also contain about 20 to 24 trace elements including Hf and Y as minor elements.

Vaidurya (Cats eye)

Synonyms

विदूररत्नं वैडूर्यं केतुरत्नं विदूरजम्।
विडालास्यं विडालाक्षं वायजञ्च प्रकीर्तितम्॥
(R.T. 23/112)

Vidurratna, Vaidura, Keturatna, Viduraja, Vidalasya, Vidalaksha and Vayaja are synonyms of Vaidurya.

It is also known as Cat's eye or Lahsuniya because it looks similar to eye of Marjara. It contains white lines. Vaidurya contains specific line and contains silicon and oxygen. It is found throughout India and Lanka, Myanmar, Brazil, Norway, America. It has chemical formula BeOAl2O3. Its Hardness is 8.5 and Specific Gravity 3.71.

Types

It is of two types :

1. Emerald group
2. Quartz group

According to colour it is of following four types-

1. Shweta
2. Dhumra
3. Krishanbha
4. Mixed colour

Grahya Lakshana

वैदूर्यं श्यामशुभ्राभं समं स्वच्छं गुरू स्फुटम्।
अभ्रशुभ्रोत्तरीयेण गर्भितं शुभमीरितम्॥
(R.R.S. 4/57)

Shyamshubhra Abha (Blackish white lustre), Sama (Even), Svachchha (Free from Doshas), Guru (Heavy), Sphutum (Bright), having colour similar to white mica inside, is of acceptable quality.

वैडूर्यं गुरु सुस्निग्धं विडालेक्षणसप्रभम।
भ्रमच्छुभ्रोत्तरीयाढ्यं वैडूर्यं जात्यमुच्यते॥
(R.T. 23/113)

Guru (heaviness), Susnigdha (unctuousness), Viasalaksha (similar to Cat eye), Saprabha (shining), having white spots and streaks, devoid of holes are the suitable characteristics of Cat's eye.

Agrahya Lakshana

श्यामं तोयसमच्छायं चिपिटं लघुकर्कशम्।
रक्तगर्भोत्तरीयं च वैदूर्यं नैव शस्यते॥
(R.R.S. 4/58)

Having black coloured Toyachhaya (Shade similar to water), Chipita, Laghu (Light in weight), Karkasha (Rough), Raktagarbha (Inside red coloured) Vaidura is not acceptable.

विच्छायं लघु रूक्षञ्च सत्रासं चिपिटं खरम्।
कृष्णं तथा मृच्छिलाढ्यं वैडूर्यं हेयमीरितम्॥
(R.T. 23/114)

Vicchaya (lustreless), Laghu (light), having mud and stone particles inside, dry, generating fear, flat and black colour are the unsuitable characters of Cat's eye.

Shodhana

त्रिफला क्वथितोपेतं वैदूर्यं याममात्रकम्।
दोलायन्त्रे परिस्विन्नं शुद्धिमायात्यनुत्तमाम्॥
(R.T. 23/115)

By doing Swedana in Dola Yantra for one Yama using Triphala Kwatha as liquid media it becomes Shuddha.

Marana

माणिक्यमारणोद्दिष्टविधिभ्यामतियत्नतः।
विदूररत्नं पुटितं त्वष्टधा मृतिमाप्नुयात्॥
(R.T. 23/116)

Vaidurya is levigated with Haratala, Manashila and Gandhaka using Lakucha Swarasa then pillets are made, dried and kept in Sharava Samputa. Now it is subjected to Gajaputa. By repeating the process for eight times the Bhasma is prepared.

Colour of Bhasma - White

Vaidurya Pishti- It is levigated with rose water till it becomes very fine powder.

Properties

वैडूर्यं रक्तपित्तघ्नं प्रज्ञायुर्बलवर्धनम्।
पित्तप्रधान रोगघ्नं दीपनं मलमोचनम्॥
(R.R.S. 4/59)

Vaidurya is Raktapitta Nashaka, Prgya, Aayu, Bala Vardhaka, pacifies pitta dominated diseases. It is Deepana and Mala mochaka.

Dose

वस्वंशतो रक्तिकाया वैदूर्यं गुञ्जसंमितम्।

प्राणाचार्यः प्रयुञ्जीत बलकालाद्यपेक्षया ॥
(R.T. 23/119)

Dosage of 1/8 Ratti to 1 Ratti after examining Bala and Kala.

Yoga

1. Nava Ratna Raj Mriganka Rasa
2. Ratna Bhagottara Rasa
3. Indrokta Rasayana
4. Churnanjana
5. Pindanjana

Research updates

Cat's eye is an optical phenomenon, possessed by certain minerals in reflected light, in which a movable wavy or silky sheen is concentrated in a narrow barad of light that changes its position as a mineral is turned. The word Chatoyance means to shine like a cat's eye in French. The precipitates that cause chatoyance in Chrysoberyl are the mineral rutile composed mostly of Titanium oxide. (https://geology in.com).

Mrigashringa (Staghorn)

Synonyms

मृंगशृङ्गं त्वेण शृङ्गं तथा मृग विषाणकम्।
हरिणशृङ्गकञ्चैव समाख्यातं भिषग्वरैः ॥
(R.T. 12/103)

Mrigashringa, Enashringa, Mriga Vishanaka, Harinshringaka are synonyms of Mriga Shringa.

Mrigashringa is composed of Calcium and phosphorus and other organic elements. Mrigashringa is one among Sudhavarga dravyas. Its source is Horn of stag deer hence it is rightly called Deer's horn or Stag deer horn. In specific, scientifically it is Antlers of deer, which means lowest tine. n Ayurveda, Mrigashringa explained for the first time in Astangahridya Sutrasthana, Anna Swarupa Vijyaneyaadhyaya.

Chemical formula- $Ca_3(PO_4)_2$

Grahya Lakshana

कीटनुपहतं दीर्घं भाराढ्यं सुदृढं तथा ।
अनेकशृङ्ग संयुक्तं मृगशृङ्गं वरं मतम् ॥
(R.T. 12/104)

Kitanupahatam (not damaged by insects), Dirgha (large), Bhara Adhya Sadrudha (heavy weight, compact) and Aneka Shringa (having many horn) is of best quality.

Marana

मृगशृङ्गं समादाय करपत्रेण कर्तयेत्।
खण्डशः कारयित्वाचत्वङ्गारग्नौ दहेत्ततः ॥
सुदग्धञ्चाथ विज्ञाय खल्वे सञ्चूर्णयेद्भिषक्।
रविदुग्धेन सम्पेष्य चक्रिकाः कारयेत्ततः ॥
शरावसम्पुटान्तःस्थं पुटेत्तीव्राग्निना भिषक्।
त्रिवारं पुटनादेणविषाणं मृतिमाप्नुयात् ॥
(R.T. 12/105-07)

Mriga Shringa is cut into small pieces by Karapatra (Saw mill) and then it is subjected to fire for combustion. When it is combusted well then it is taken out and made into powder form. Now it is levigated with Arka Ksheera and Pellets are made and dried. Then it is kept into Sharava Samputa and subjected to Puta of hard heat. The Puta process is repeated for three times.

Note- The Bhasma of Mriga Shringa is of black as well as white coloured. Black coloured Bhasma is supposed much better because it contains Calcium phosphate.

Properties

मृंगशृङ्गसमुद्भूता विभूतिर्गव्य सर्पिषा।
विनाशयेत् क्षणादेव हृच्छूलमति दारुणम्॥
(R.T. 12/108)

It is Hrida Shoola Nashaka when used with cow's Ghrita.

Does

हरिणविषाणसमुत्थाभूति क्षौद्रेण रक्तिमिता॥
(R.T. 12/108)

Dosage of 1-2 Ratti is used.

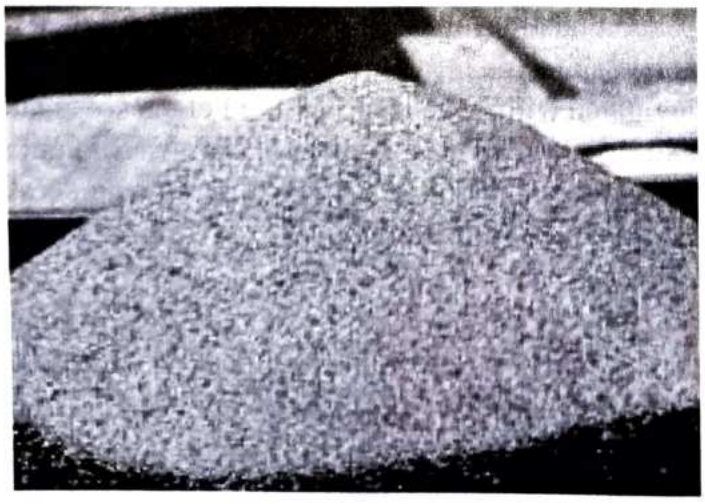
Yoga

1. Jwarankusha Rasa
2. Kandarpa Sundara Rasa
3. Trinetra Rasa
4. Grahanivajrakapat rasa
5. Balarha Rasa

Research updates

Shringa Bhasma is a odourless. dull white powder with chalk like taste, showing the presence of carbonates, sulphates, chlorides, potassium, calcium and magnesium. Analytical data shows loss on drying at 1100C 0.44%, pH of 10, acid insoluble ash 12.68%. EDAX study revealed that it contains calcium 66.13%, phosphorus 32.46% and potassium 1.41% by weights.

Sikata (Silica-SiO_2)



Synonyms

बालुका सिकता प्रोक्ता शर्करा रेतिकाऽपिच।
(A.P. 2/303)

Baluka, Sikta, Sharkara and Retika are synonyms of Sikata.

Properties

बालुका मधुरा शीता संतापाश्रमनाशिनी।
स्वेदप्रयोगतश्चैव शाखाशैत्यानिहापहा॥
तद्वश्च लेखनी प्रोक्ता व्रणोरःक्षतनाशिनी॥
(A.P. 2/304)

Sikata is Madhura Rasa, Sheeta, Santapa and Shrama Nashaka, removes cooling of Shakha arriving from Swedana Karma. It is Lekhana, Varna and Urhakshata Nashini.

Vyomashma (Sangeyashab-Jade)

Synonyms

Vyomashama, Haritashama, Yashavashila, Harinmani. It is also called as Haula Dili. Vyomashama has a green colour. Its Pisthi is widely used.

Sources

It is a hard, transparent stone having yellowish green or white or dark green colour. Khalva Yantras are manufactured from it. Its chemical formula is $NaAlSi_2O_6$. It is obtained from Tibbet, Myanmar, Turkey, Siberia, China New Zealand etc. countries. Its hardness is 7 and specific gravity is 3.3.

Types

According to modern it is of two types-

1. Vrikkaja (Nephrite)
2. Praharija (Jadite)

Grahya Lakshana

Yellowish green colour, hard and clean is of acceptable quality.

Shodhana

Nirvapa in Arjuna Kwatha or rose water for twenty-one times.

Marana

Gajaputa is given after levigating it. The process is repeated for ten to twelve times.

Colour of Bhasma- White

Pishti- It is prepared with rose water

Properties

Hridya Darubalya, High blood pressure etc.

Dose

Bhasma - 2 to 3 Ratti

Pishti- 2 to 3 Ratti

Yoga

1. Brahmi Vati
2. Javahar Mohra Vati
3. Vyomashma Pishti

Kousheyashma (Asbestos)

It is soft and fragile in nature. It is white in colour with red yellowish in tinge.

Sources

It is known as Kausheyashma or Sangereshama. It is soft stone which looks like silk threads having red yellowish white. It is used to prepared fire proof cloths. It is silicate of magnesium. Availability in south India.

Shodhana- Kausheyashma should be heated and dipped in milk. This procedure should be repeated for six more times.

Marana

It is levigated with Kumari Swarasa and subjected to Gajaputa. The white-coloured Bhasma is prepared after giving seven to eight Gajaputa.

Pishti- It is prepared by levigating it for three to four days with rose water.

Properties - Raktapitta Nashaka. It is used in Prameha, Pradara etc.

Dose-2 to 3 Ratti.

Research updates- Studies have proved that it is variety of asbestos exhibiting the property of silicate of magnesium and calcium. Experimental study done on Koushayashma Bhasma on antiepileptic action shows that it has significant results on reducing the duration of latency of onset, clonic convulsion and duration of depth in animal model of epilepsy induced by PT2 at a therapeutic dose.

Badarshama (silicate of lime)

Synonyms

Ber Patthara, Hazrat Bera, Hazrul Yahuda

Sources

It comes from Arab, Misra. etc. countries.

Grahya, Agrahyata

Both the sides of this are spiny and surface is wrinkled having whitish brown colour from out side and greenish colour in side. It's length is about 1-1.5 inches and breath of half cm.

Shodhana

Nirvapa in Mulaka Swarasa or Kadalikanda Swarasa for seven times.

Marana

Pellets are made with Muli Swarasa or Kadali Kanda Swarasa by doing levigation. Now it is dried and kept in Sharava Samputa and subjected to Gajaputa. By giving such 5-7 Putas its Bhasma is prepared.

Colour of Bhasma- White

Pishti- It is prepared by triturating it with rose water till it becomes very fine powder.

Properties

Ashmari Shool Nashaka, Mutrala, Pittashamaka and Mutra Ashmari Nashaka.

Dose- 2- 4 Ratti

Research updates

Study done by Reddy Seema MB on the Badarashm Bhasma and Pishti show the following results on various parameters.

Sr. No.	Parameters	Badarashna Bhasma	Badarshana Pisti
1.	pH	12.46	8.77
2.	LOD (at 1050)	0.08%	0.32%
3.	Total Ash	83.58%	57.38%
4.	Acid insoluble ash	1.10%	1.13%
5.	Calcium content	52.61%	36.96%

Reddy Seema MB, Belapu V, P Radhika R.G., Comparative pharmaceutical and Analytical study of Badarshma Bhasma and Pishti, Jour. of Ayurveda & Holistic medicine vol. IV Issue I pp 12-23.

11 CHAPT. Kalpana Nirman-III (Method of Preparation of different dosage forms)

Syllabus

Sharkara Kalpana - General method of preparation, difference between sharkara kalpana and syrup, importance of temperature, precautions, confirmatory tests, packing, preservation, shelf life with Example of Tulasi Arka Sharkara. **Gudapaka-** General Method of Preparation, importance of temperature, precautions, confirmatory tests, packing, preservation, shelf life with Example of Manibhadra Guda, Guda Pippali. **Lavana Kalpana-** General Method of Preparation, importance of temperature, precautions, confirmatory tests, packing, preservation, shelf life with Example of Narikela Lavana.

Kshara Kalpana- General Method of Preparation, importance of temperature, precautions, confirmatory tests, packing, preservation, shelf life with Example of Kadali Kshara, Chincha Kshara. **Ayskriti Kalpana-** General Method of Preparation, importance of temperature, precautions, confirmatory tests, packing, preservation, shelf life with Example Ayaskriti. **Lepa Kalpana-** General Method of Preparation, importance of temperature, precautions, confirmatory tests, packing, preservation, shelf life with Example of Avalgunjadi Lepa, Keshavardhaka Lepa.

Learning objective

1. Describe sharkarakalpana along with preparation method ofSyrup.Explain therapeutic importance of prepared Sharkara kalpana along with its shelf life.
2. Describe Gudapaka preparation method with its confirmatorytests and precautionsExplain therapeutic importance of preparedGudapaka along with its shelf life.
3. Describe Lavana kalpana preparation method with itsconfirmatory tests and precautions.Explain therapeuticimportance of prepared Lavana kalpana along with its shelf lifeand packaging techniques.
4. Describe Kshara kalpana preparation method with itsconfirmatory tests and precautions. Explain therapeuticimportance of prepared Kshara kalpana and Ksharasutraintegration with Shalya tantra department along with its shelf lifeand packaging technique.
5. Describe Ayaskriti kalpana preparation method with itsconfirmatory tests and precautions. Explain therapeuticimportance of prepared Ayaskriti kalpana along with its shelflife and packaging techniques.
6. Describe Lepa kalpana preparation method with its confirmatorytests and precautions. Explain therapeutic importance of prepared Lepa kalpana, integration with Kayachikitsa and Panchakarmadepartment along with its shelf life and packaging techniques.

Total -14 hours (Lecture :08 hour, Non-lecture: 06 hours)

Marks- 10 marks, LAQ (10 Marks)- Yes, SAQ (5 Marks)- Yes, MCQ- Yes

Sharkara Kalpana

General method of preparation

अम्भस्यष्टगुणे निधाय च निशि द्रव्यं पलं कुट्टितं प्रातर्मन्दकृशानुना परिपचेदष्टांश शेषं नयेत् ।

तत् सङ्गाल्य पटैश्चतुःपलासितां निक्षिप्य भूयः पचेद्यावत्तन्तुभवोऽवतार्य तदिदं प्राहुर्बुधाः शार्करम् ॥

(Siddha Bheshaja Mani Mala 4th Guchha)

One Pala of Yavakuta Dravya is soaked into 8 Pala of water and it is left for overnight. Next morning it is boiled over Mandagni so that its 1/8 quantity is left. To this Kwatha 4 Pala of sugar is added and it is boiled till Tantus (Threads) are appeared. Now boiling is stopped and it is taken out from fire. It is Sharkara Kalpana.

According to Yadavji

हिमे फाण्टे श्रृतेऽर्के वा शर्करां द्विगुणां क्षिपेत्।
मन्देऽग्नौ साधितं पूतं पटात्तच्छार्करं स्मृतम्॥

(Dr. Gu.Vi.Utta.Yadav ji)

Anyone of the Kalpana like Hima, Phanta, Kwatha, Arka etc. is taken in one part and two parts of sugar is added to it then heated over Mandagni till it attains Tantu stage. After this vessel is taken out from fire and it is filtered with cloth. The product obtained is called as Sharkara.

Difference between Sharkara Kalpana and syrup

Sharkara Kalpana	Syrup
It is prepared Hima, Phanta, Kwatha, Arka as liquid	Syrup is the aqueous solution of Sucrose/ Dextrose
Sugar(Sucrose) is used	Sucrose/Dextrose/ Sorbitol is used
Coloring/Flavoring agent etc. are not used	Coloring/Flavoring agent etc. are used
Alcohol is not used	When hydro alcoholic solution is used then it is known as elixir

Importance of temperature- Controlled temperature should be maintained so that volatile content of Hima, Phanta and Arka should not destroy.

Precautions

1. Heating should be done carefully.
2. Hima, Phanta and Arka should be prepared carefully.
3. Siddhi Lakshana should be observed carefully.

Confirmatory tests

- 2 threads should be seen in sugar solution.
- Drop of sugar solution should be sink and settle at the bottom of water containing bowl.

Packing- It should be stored in glass bottle or food grade plastic bottle.

Preservation-Preservations are added when Sharaka Kalpana is having thin consistency. Sodium benzoate, benzoic acid, potassium meta bi-sulphide etc. are commonly used preservatives.

Shelf life- 3 years

Tulasi Arka Sharkara (Anubhuta)

Ingredients

1. Tulsi Arka- 1 part
2. Sugar- 2 part

Method of Preparation- Tulsi Arka is obtained by Arka preparation method. To this Arka sugar is added and it is boiled till sugar solution having consistency of 1-2 thread (Tara) appears. Now heating is stopped and when it is cooled it is stored.

Dose- 5-10 ml

Uses- Kasa, Shwasa, Pratishyaya

Gudapaka

General Method of Preparation- The method of preparation of Guda Paka is similar to Avaleha Nirmana. The Kashaya, Swarasa (Juice) or any other liquid preparation should be prepared as per classical reference and it should be taken in a clean bigger vessel and placed over mild fire. Specified quantity of Guda should be dissolved in it. After complete dissolution of Guda the blend may be filtered once to get rid of physical impurities present in it. The filtrate should be taken in a wide mouthed clean stainless-steel vessel and boil it over mild fire and reduce it to 2 to 3 thread consistency. Later the vessel should be taken out of fire and fine powder of medicinal drugs should be added little by little and stirred well to a homogeneous mixture. Honey should be added after the preparation is fully cool and it is packed in dry airtight wide mouthed containers and preserved.

Importance of temperature- Controlled

temperature should be given to avoid burning of Guda.

Precautions

1. Heating should be done carefully.
2. Siddhi Lakshana should be observed carefully.
3. Prakshepaka Dravya should be mixed properly to avoid lump formation.

Confirmatory tests

तोयपूर्णे यदा पात्रे क्षिप्तो न प्लवते गुडः।
क्षिप्तश्च निश्चलस्तिष्ठेत् पतितस्तु न शीर्य्यते॥
यदा दर्वीप्रलेपः स्याद् यावद्वा तन्तुलो भवेत्।
एष पाको गुडादीनां सर्वेषां परिकीर्त्तितः॥
सुखमर्दः सुखस्पर्शो गुडः पाकमुपागतः।
पीडितो भजते मुद्रां गन्धवर्णरसान्वितः॥
(Chakradatta Jwaratisara. 89-91)

Sign of Guda Paka Lakshana	Illustration
Kshipto Na Plvate Guda	When it is dropped into vessel filled with water it does not float.
Kshiptastu Nishch-alam Tishtheta	When dropped into water it settle down straight without any movement.
Patitastu Na Shiryate after settle down into	It does not spread or break water.
Darvi Pralepa	Stickiness to ladle.
Tantuli bhava	When drop of in process sugar solution is put between thumb and index finger and then stretched it produces thread in between both fingers.
Sukha Marda, Sukha Sparsha	Pleasant in touch and pressing
Pidete Bhajate Mudra	Form impression of thumb when pressed
Gandha Varna Rasanvita	Having sm ell, colour to that of ingredients.

Packing/Preservation - As like to Avaleha

Dosage- One Karsha (12gm) along with milk or water.

Shelf life- 3 years

Manibhadra Guda

विडङ्गसारामलकाभयानां पलत्रयं, त्रीणि पलानि कुम्भात्।
गुडस्य च द्वादश, मासमेष जितात्मनां हन्त्युपयुज्यमानः॥
कुष्ठाश्वित्रश्वासकासोदरार्शो मेहप्लीहग्रन्थिरूग्जन्तुगुल्मान्।
सिद्ध योगं प्राह यक्षो मुमुक्षोर्भिक्षोः प्राणान् माणिभद्रःकिलेप्रम्॥ (Ash. Hri. Chi. 19/31-32)

Ingredients-

1. Vidanga	- 48 gm.
2. Amalaki	- 48 gm.
3. Haritaki	- 48 gm.
4. Kumbha (Trivrita)	- 154 gm.
5. Jaggery	- 576 gm.
6. Water	- Q.S.

Instruments/Equipment's- Big vessels, Laddle, Heating device.

Method of preparation- Sufficient quantity of water is taken into a vessel and jaggery is added to it. Now boiling is done till Avaleha Siddhi Lakshana are appeared. After that heating is stopped and fine powders of all the four ingredients is mixed well.

Dose- 6 gm.

Anupana- Milk or water

Therapeutic uses- Kushta, Shwitra, Kasa, Udararoga, Arsha, Meha, Pleeha, Granthi, Krimi, Gulma.

Guda Pippali

विडंग त्र्यूषणं कुष्ठं हिंगु लवण पञ्चकम्।
त्रिक्षारं फेनकं वह्निः श्रेयसी चोपकुञ्चिका॥
तालपुष्पोद्भवं क्षारं नाड्यः कूष्डमाण्डकस्य च।
अपामार्गस्य चिञ्चायाश्चूर्णानि चिक्कणानि॥
सर्वचूर्णसमंदेय चूर्णमत्र कणोद्भवम्।
एतस्याद् द्विगुणच्चूर्णोत्पुराणो द्विगुणों गुड़ः॥
(Bhaishajya Ratnavali Pleehayakruta Roga)

Ingredients-

Vidanga	- 1 Part
Shunthi	- 1 Part
Maricha	- 1 Part
Pippali	- 1 Part
Kushtha	- 1 Part
Hingu	- 1 Part
Sauvarchal Lavana	- 1 Part
Saindhava Lavana	- 1 Part

Vida Lavana	-	1 Part
Samudra Lavana	-	1 Part
Audbhidda Lavana	-	1 Part
Swarjika Kshara	-	1 Part
Yavakshara	-	1 Part
Tamkana	-	1 Part
Samudraphena	-	1 Part
Chitraka	-	1 Part
Gajapippali	-	1 Part
Upakunchika	-	1 Part
Tala Pushpodobhava Kshara	-	1 Part
Kushmanda Kshara	-	1 Part
Apamarga Kshara	-	1 Part
Chincha Kshara	-	1 Part
Pippali	-	22 Parts
Purana Guda	-	88 Parts

Method of Preparation- Jaggery is taken in a mortar and it is pounded then fine powder of ingredients from 1-23 are mixed levigating it.

Dose- 6-12 g

Anupana- Water and milk

Shelf life- 3 years

Therapeutic uses- Yakruta Pleeha Roga, Udara Roga, Jwara, Kasa

Lavana Kalpana

Lavana Kalpana is one of the formulation from classical ayurvedic texts. Lavana Kalapa are the pharmaceutical preparations in which main constituents are Saindhava Lavana & ash of other drugs obtained after giving appropriate 'Puta'. There are many Lavana Kalapa described in various Ayurved Granthas & texts but only few are in practice e.g Narikel Lavana.

Method of Preparation

Depending on methods of preparation, it can be divided into two types - Lehapaka Vidhi and Putapaka Vidhi.

1. Lehapaka Vidhi - In this method, the drugs to be added in the form of Kwatha (decoction) are first boiled in the water. Then the prepared decoction is heated again on fire along with the Lavana. To that concentrated decoction, the powder of the other drugs is added & mixed well to obtain the Lavana Kalpa. e.g. Abhaya Lavana.
2. Putapaka Vidhi - Raw drugs along with Lavana are taken in an earthen vessel called Sharava. Then another Sharava is placed over it upside down and the Matkapada(clay smeared cloth) is used to seal the junction of these two Sharavas. Then appropriate puta is given with cow dung cakes & Lavana Kalpa is obtained. e.g Arka Lavana.

Importance of temperature-More temperature may change crystalline form of salt.

Precautions

1. Clay smeared cloth wrapped should be completely dried.
2. Heating of 10-12 Uplas is needed or it is kept in fire till the pot is red hot.

Confirmatory tests

1. The red hot colour of the earthen pot indicates that all the contents in Sharava became ash.
2. Kajjalvarna of the prepared Lavana Kalpas is said to be the Siddhi Lakshana in the context of Narikela Lavana in 'Rasatarangini'.

Dosage- 2 Masha

Packing/Preservation- Air tight container.

Shelflife-5 years

Narikela Lavana

सुपक्वं ससलिलं नारिकेलं समाहरेत् ।
अपनीयं जटां वृद्धिपत्रेण स्फोटयेद् दृशम् ॥
जातरन्ध्रान्नारिकेलान्नीरं सर्वं परित्यजेत् ।
सुचूर्णितं सैन्धवं तु दशतोलकसम्मितम् ॥
निक्षिप्य रन्ध्रमार्गेण ततो रन्ध्रं निरोधयेत् ।
वसनेन समाच्छाद्य परितो लेपयेन्मृदा ॥
रोद्रयन्त्रे विशोष्याथ पुटयेत्तु महापुटे ।
तद्गोलकं स्वाङ्गशीतं प्रयत्नेन समाहरेत् ॥
सैन्धवं कज्जलीवर्णं कपालांशोज्झितं हरेत् ।
लवणो नारिकेलोख्यः समाख्यातो भिषग्वरैः ॥
लवणो नारिकेलो यः पाचन पित्तनाशनः ।
अम्लपित्तहरः कामं पित्तशोषशूलनुत् ॥
वातजं पितजं शूलं श्लेष्मजं सन्निपातजम् ।
शूलञ्च परिमाणोत्थं नाशयेद विकल्पतः ॥
लवणो नारिकेलाख्यो माषकद्वयसम्मितः ।
नृसारयवजोपेतः पित्तशोषशूलनुत् ॥

(R.T. 14/123-30)

लवणो नारिकेलाख्यो माषकद्वयसम्मितः ।
नृसारयवजोपेत पित्तशोषजशूलनुत् ॥
(रसतरङ्गिणी 14)

नारिकेलं सतोयं च लवणेन सुपूरितम् ।
मृदाववेष्टितं शुष्कं पक्वं गोमयवह्निना ॥
पिप्पल्या भक्षितं हन्ति शूलं च परिणामजम् ।
वातिकं पैत्तिकञ्चापि श्लेष्मिकं सान्निपातिकम् ॥
(भावप्रकाश-शूलरोगे)

Ingredients-

1. Narikela - One
2. Saindhava Lavana - 10 Tola

Instruments/Equipment's- Knife, Khalva Yantra, Uplas, Cloth, Multani Mitti, Spoon.

Method of preparation-Saindhava Lavana is crushed and put separately. Narikela is taken and its outer fibrous part is removed. A hole is made through its Netra part carefully and through it Saindhava Lavana is filled into it and then this hole is closed. Now Multani Mitti smeared cloth is wrapped over it and left for drying when it is dried then it is subjected to fire of 8 to 10 Uplas. After Paka it is taken out and when it is cooled then outer covering is removed. Narikela along with Saindhava Lavana is made into powder form it is black is colour.

Dose- 2 Mash (125-250 mg)

Anupana- Water

Therapeutic uses- Amlapitta, Udarashoola, Deepan Pachana, Parinama Shoola.

Kshara Kalpana

General Method of Preparation- The drug is cut into small pieces and dried well. The pieces are put in earthen pot and burnt to ash. When the drug is completely burnt and reduced to ash it is allowed to cool. Six times of water is added to ash and mixed well. It is then strained through a piece of cotton cloth. The process may be repeated till clear liquid is obtained. This liquid is put in an iro or earthen pot and heated over a moderate fire till the water is evaporates leaving a solid white substance which is collected. This is known as Kshara.

Ratio of Ash and water according to different Acharya's

Acharya	Ash	Water
Sushruta	1 part	6 parts
Sharangadhara	1 part	4 parts
Rasa Tarangini	1 part	8-4 parts
Yadavji	1 part	6 parts

Importance of temperature- Higher temperature is needed so that ash (white colour) can be obtained.

Precautions

1. Burning process should be done properly so that complete drug is burnt.
2. Filtering should be done carefully so that clear liquid is obtained.
3. Evaporation should be done carefully.

Confirmatory tests- Kshara should be white colored powder.

Packing/Preservation- it should be kept in air-tight bottles.

Dosage- 2 to 8 Gunja (250-100mg)

Shelf life-5 years.

Preparation of Kshara Sutra

This procedure is done for 4 times. With the completion of 4 Bhavanas with Snuhi Ksheera and Haridra Churna, we should have successfully given 21 Bhavanas in total (10 with Snuhi Ksheera, 7 with Snuhi Ksheera and Apamarga Kshara and final 4 by Snuhi Ksheera and Haridra Churna).

Storage- collected in a sterile jar.

Kadali Kshara

Reference- A.F.I. Part I 10:5

Ingredients

1. Kadali Kanda Ash- 1 Part
2. Water - 6 Parts

Method of Preparation- Ash obtained by burning of Kadali Kanda and water is mixed well and it is filtered. The obtained liquid is evaporated

and substance which is collected is Kadali Kshara.

Dosage- 125-250 mg

Anupana- Water

Therapeutic use- Gulma, Jirnna Jwara, Aruchi, Ajirna etc.

Chincha Kshara

Reference- Rasa Tarangini 14/107

Ingredients

1. Chincha Ash- 1 Part
2. Water - 4 Parts

Method of Preparation- Ash obtained by burning of Chincha Ash and water is mixed well and it is filtered. The obtained liquid is evaporated and substance which is collected is Chincha Kshara.

Dosage- 125-250 mg

Therapeutic use- Agnimandya, Gulma, Shoola, Mutra Ashmari

Ayskriti Kalpana

General Method of Preparation

तीक्ष्णलोहपत्राणि तनूनि लवणवर्गप्रदिग्धानि गोमयाग्निप्रतप्तानि त्रिफलाशालसारादिकषायेण निर्वापयेत् षोडशवारान्, ततः खदिराङ्गारतप्तान्युपशान्ततापानि सूक्ष्मचूर्णानि कारयेध्दनतान्तवपरिस्रावितानि, ततो यथाबलं मात्रां सर्पिर्मधुभ्यां संसृज्योपयुञ्जीत, जीर्णे यथाव्याध्य-नम्लमलवणमाहारं कुर्वीत, एवं तुलामुपयुज्य कुष्ठमेहमेदःश्वयथुपाण्डुरोगोन्मादापस्मारानपहत्य वर्षशतं जीवति, तुलायां तुलायां वर्षशतमुत्कर्षः, एतेन सर्वलौहेष्वयस्कृतयो व्याख्याताः ॥ (Su.Chi. 10/11)

Ayaskriti in Churna (powder) form- Acharya Sushruta had mentioned the procedure to prepare this type of iron preparation out of three types mentioned (Ayaskriti, Aushadhi Ayaskriti and Mahaushadhi Ayaskriti) in this procedure we obtain the powder form of iron which can be used for various medicinal purposes in respective disorders. Following is the procedure for making powder form of Ayaskriti;

1. **Lepana** - Smearing of Lavana paste - Thin sheets of Tikshan Loha are taken and paste of Lavana is smeared over it.
2. **Nirvapana** - Then these smeared sheets are heated red hot and dipped in liquid medium of Triphala- Shalasaradi Kashaya. This procedure is repeated for 16 times.
3. **Churna (powder formation)** - After Nirvapana, these sheets are again heated on Khair wood heat. After cooling by itself this sheets are pounded and filtered through cloth to obtain fine powder.

Ayaskriti in Avaleha (paste form)- Acharya Charaka had mentioned the procedure to prepare this type of iron preparation. (Cha. Chi. 1/3/23) the procedure can be understood in following steps;

1. **Nirvapana** - Tikshna Loha sheets of 4X4 Anguli dimension and thickness of sesame seed are taken. These sheets are made red hot by application of strong heat. This red hot sheets are then dipped in liquid medium of Triphala Kwatha, Gomutra, Jyotishmati Kshara Udaka, Ingudi Kshara Udaka and Palash Kshar udaka respectively. These procedure turns the color of sheet to dark black - Anjanvat.
2. **Churna** - Powder making - this black colored sheets are pounded well and fine powder is made out of it.
3. **Avaleha** - Paste formation - thus obtained powder is then mixed with Madhu - honey and Amla juice in equal quantity.
4. **Kala Samskara** - Storing - Then this paste is stored in Ghee smeared vessel and kept in Yava Rashi (barley grain) for one year. Each month the ingredients in vessel are mixed thoroughly and kept as before. After one year thus formed paste is used along with Ghrita and Madhu.

Ayaskriti in Sandhana (fermented syrup form)- Third type mentioned by Acharya Sushruta i.e. Mahaushadhi Ayaskriti is in Sandhan form. Following is the procedure;

1. Kwath - decoction - as mentioned in previous

procedure, here kwath of drugs belonging to Shalasaradi Gana are used.

2. Nirvapana - Thin iron sheets are then heated red hot and dipped in this Kwath.
3. Sandhana - fermentation - Thus formed preparation is kept in appropriate Sandhan Patra and Pippali powder, Madhu and Guda (Jaggery) is added to it and kept for 15 to 30 days.

Importance of temperature- In this dosage form metals are heated so that these become red hot so proper temperature is needed for it.

Therapeutic uses-

Ayaskriti form with dose	Classical uses
Powder form Dose - according to Agni (125 to 500 mg)	Kushtha, Prameha, Medo-roga, Shotha, Pandu, Unmada, Apasmara and Rasayana- (Su.Chi. 10/11)
Avaleha-paste form Dose - according to Agni (2 to 5 gm)	1. As a Rasayana in all disorders. (Cha.Chi.1/3/23) 2. Kushtha, Prameha, Medorog, Shotha, Rajya-kshma specifically - (Su. Chi. 10/12)
Sandhana-syrup form Dose - according to Agni (1 Shukti 24 gm/ml)	Kushtha, Prameha, Medo-rog, Shotha, Rajyakshma specifically - (Su.Chi.10/12)

Precautions - Heating and quenching should be done properly.

Confirmatory tests- Very fine and smooth powder

Packing/Preservation- It should be stored in air tight container.

Shelf life- As like Bhasma.

Lepa Kalpana

General Method of Preparation

द्रव्यमार्द्रं शिलापिष्टं शुष्कं वा सद्रवं तनु।
देहे प्रलेपनार्थं तल्लेपं इत्युच्यते बुधैः॥
(Ara. Gu. Vig. Utta. Yadavji)

Wet drugs are made into Kalka form, if drug is dry then it is converted into Kalka form by adding little quantity of liquid and grinding it. This Kalka or paste is applied externally on the body and it is termed as Lepa.

Method of application for Lepa Kalpana

रोमाभिमुखमादेयौ प्रलेपाख्यप्रदेहकौ।
वीर्यं सम्याग्विशात्याशु रोमकूपैः शिरामुखैः॥
(Sha.Uttar 11/13)

Lepa should be applied in an upward or reverse direction as of the hairs over skin (Pratiloma). Application of Lepa by this method causes quick entry of Virya of drug to Shira Mukha.

Precautions-

1. न च पर्युषितं लेपं कदाचिदवचारयेत् (Su.Sutra. 18/14)
   Stale Lepa should not be applied.
2. उपर्युपदि लेपं च न कदाचित् प्रदापयेत्॥ (Su.Sutra. 18/14)
   It should not be coated after applying once.
3. न रात्रौ लेपनं कुर्याच्छुष्यमाणं न धारयेत्॥ (Sha.Uttar. 11/74)

Lepa should not be applied in the night and it should not become dry after application. Drying of Pradeha causes Peedana.

तमसा पिहितो ह्यूष्मा रोमकूपमुखे स्थितः।
विना लेपेन निर्याति रात्रौ नो लेपयेदतः॥
रात्रावापि प्रलेपादिविधिः कार्यो विचक्षणैः।
अपक्व शोथे गम्भीरे रक्त श्लेष्मसमुद्भवे॥
(Sha.Uttar. 17/76-77)

The heat of body generally comes out through pores of skin during night and application during night causes blocking of the pores which causes the obstruction in transfer of heat. But in case of Apakwa Shotha, Gambhira and Rakta Pittaja Shotha Lepa can be applied even at night.

Confirmatory tests- Lepa should have uniform consistency having Gandha, Varna and Rasa.

Packing/preservation- Lepa Churna should be kept in air tight containers.

Shelflife- 2 years (Lepa Churna)

Avalgunjadi Lepa (Reference- A.F.I. Part I -11:1)

कुडवोऽवल्गुजबाजाद्धरिताल चतुर्थ भागसम्मिश्रः।
मूत्रेण गवां पिष्टः सवर्णकरणं परं श्वित्रे॥
(अ.हृ.चिकि. 20/13)

Ingredients-

1. Suddha Avalguja (Bakuchi) seed- one Kudava (192 gm)
2. Haratala Patra- 1 Pala (48 gm)
3. Gomutra- Q.S.

Method of Preparation- Both Churna mixed with required quantity of Gomutra and paste obtained is daily applied over the affected part as Avalgujadi Lepa.

Use- Shwitra, Varna Vikriti.

Keshavardhaka Lepa

गोक्षुरस्तिलपुष्पाणि तुल्ये च मधुसर्पिषी।
शिरः प्रलेपनं तेन केशसंवर्धक परम॥
(शा.उ.)

Ingredients-

1. Gokshura Seed	-	1 Part
2. Tila Pushpa	-	1 Part
3. Honey	-	1 Part
4. Ghrita	-	1 Part

Method of Preparation- Fine Kalka of Tila Pushpa is prepared in clean Khalva Yantra or flower are dry then fine powder of same is prepared. This Kalka added with equal quantity of Gokshura Churna, Madhu and Ghrita. The paste obtained is daily applied over the scalp.

Use- Kesha Samvardhana (good for hair growth)

Vati Kalpana

वटकाश्चाथ कथ्यन्ते तन्नाम गुटिका वटी।
मोदको वटिका पिण्डी गु वर्तिस्तथोच्यते॥
(Sha. Madh. 7/1)

The dosage form prepared in the form of tablet or pills are known as Vati and Gutika. These can be made of one or more drugs of plant, animal or mineral origin. (A.F.I. part I- page.193).

Vataka, Gutika, Vati, Modaka, Vatika, Pindi, Guda and Varti are synonyms to each other. These all are solid dosage form having different size and weight.

According to ingredients these are of two types:

1. Rasa drugs containing Vati like Sanjivani Vati, Arogyavardhini Vati etc.
2. Only herbal containing Vati like Chitrakadi Vati, Eladi Vati etc.

Method of preparation

Acharya Sharangadhara has described two methods for preparation of Vati.

Agni Paka method

लेहवत्साध्यते बह्नौ गुडो व शर्करा तथा।
गुग्गुलुर्वा क्षिपेत्तत्र चूर्ण तन्निर्मिता वटी॥
(Sha. Madh 7/2)

It is solid dosage form prepared by fine powder of Dravya Aushadhi with Guda, Guggulu.

कुर्यादवह्निसिद्धेन क्वचित गुग्गुलुना वतीम्।
द्रवेण मधुना वापि गुटिकां कारयेत् बुधः॥
(Sha. Madh. 7/2)

In this method Guda, Sharkara or Guggulu is mixed with some amount of water and it is kept on mild fire. It is stirred well. When the stage of Leha Vata is achieved then it is taken out from fire and fine powder of said drugs is mixed into it by sprinkling it and mixed well by continuous stirring. Now Vati of desired size is made.

Note- If any metal is indicated in formulation, then its Bhasma should be taken. If Parada and Gandhaka are indicated then Kajjali should be taken.

Bhawana Method- In this method very fire powder of drug is taken into a Khalva Yantra. To this powder liquid like Honey, Swarasa etc. is added and Mardana is done till it becomes doughy mass so that Vati should be made from it help of Ghrita.

If Guggulu is to taken then it is pounded well with till it becomes very soft and fine powder get

assimilated into it. Then Vati of desired size is made. Now a day end runner or edge runner are used for proper mixing of powder to Guggulu. Powder should be mixed properly to avoid lump formation.

Note- Vati can be made by stick making machine (First stick is made) and then by cutting it by stick cutting machine from this method uniformed size Vati can be obtained.

Vatis are prepared with Churna Kalpana. When Vati is made with Agni Samyoga then the Vati becomes Laghu in comparison to Churna. While if these are prepared by Bhawana method then Vati becomes more potent.

Guggulu Kalpana

Guggulu is an exudate (Niryasa) obtained from the plant Commiphora mukul. Formulations having the exudate as main effective ingredients are known as Guggulu.

There are five different varieties of Guggulu described by Acharya Bhava Mishra these are 1. Mahisaksha, 2. Mahaneela, 3. Kumuda, 4. Padyma, 5. Hiranyakha (Kanaka) of these two varieties namely Mahishaksha and Kanka are usually preferred for medicinal preparations. Mahishaksha is dark greenish brown while Kanaka is yellowish brown in colour. Shodhana of Guggulu should be done before using it.

Process of Shodhana (Reference Ayurvedic Formulary of India Part I)

1. Sand, stone, glass etc. are first removed.
2. It is then broken into small pieces.
3. It is thereafter bundled in a piece of a cloth and boiled in Dola Yantra containing any one of the liquids like Gomutra, Triphala Kwatha, Dugdha etc.
4. The boiling is continued till the Guggulu becomes a soft mass. It is then taken out of the cloth and spread over a smooth board smeared with Ghee or oil.
5. By pressing with fingers, the sand and other remaining foreign impurities are removed. It is taken out again fried with Ghee and ground in a stone mortar. This is called Shodhita Guggulu.

Method of preparation- Guggulu (Vati) can be made by following two procedures.

1. By Agni Paka method
2. By Kuttana method

1. **Agni Paka method-** In this method Shuddha Guggulu is dissolved into waters, Kwatha etc. then it is kept over fire till it becomes Leha Vata. After that fine powder of drugs is added to it to make Vati.
2. **By Kuttana method-** In this method in a mortar Shuddha Guggulu is taken along with some Ghrita. Now Kuttana is done till it becomes smooth and waxy. Now the powder is added and again Kuttana is done till it is mixed uniformly and dough to make Vati.

कुट्टनं च लक्ष संख्याकनिर्घातैरविच्छेदं कार्यमिति सम्प्रदायः। यावत् सिक्थ तुल्यमायति तावद्वाऽष्टप्रहरभविच्छेदमिति केचित्। घृतं कुट्टनसमय एव वारंबारं दातव्यम् । (Adhamalla)

The Kuttana should be done for 1 Lakh times so it becomes like waxy or till 8 Prahara time period. During Kuttana process Ghrita should be added again and again.

Tablet

According to Indian Pharmacopoeia the tablet is defined as pharmaceutical tablets are solid, flat or biconvex discs prepared by compressing a drug or a mixture of drugs with or without suitable diluents. They vary in shape and differ greatly in size and weight, depending on the number of medicinal substances and the intended mode of administration.

Types of Tablets

Tablets may be classified as follows-

(A) **Tablet ingested orally-** These are further classified

1. Compressed tablet
2. Multiple compressed tablet

3. Delayed action and enteric coated tablet
4. Film coated tablet
5. Sugar coated tablet
6. Chewable tablet

(B) **Tablets used in oral cavity**

1. Buccal and sublingual tablet
2. Dental cones
3. Lozenges

(C) **Tablets administered by other route**

1. Implantation
2. Vaginal tablet

(D) **Tablet used to prepare solution**

1. Effervescent tablet
2. Dispersing tablet
3. Hypodermic tablet
4. Tablet triturates

A. Oral tablets

1. **Compressed tablets-** Standard uncoated tablets are manufactured by compression. The general method involves wet granulation, dry granulation or direct compression, used for rapid disintegration and drug release. In addition to medicament these tablets usually contain diluents, binders, disintegrates, glidants etc. These tablets are used for both type of action i.e. systemic and local action.
2. **Multiple compressed tablets-** Multiple compressed tablets are prepared by subjecting the fill material to more than a single compression. The outcome may be a multi-layer's tablet or tablet within a tablet. The inner tablet being the core and the outer portion being the shell.

   Multiple layers tablets are prepared by initial compaction of a portion of fill material in a die followed by additional fill material and compression to form two layered or three-layered tablets depending on the number of separate fills and each layer may contain a different medicaments.
3. **Delayed action and enteric coated tablets-** This kind of tablet is evolved to release the drug after some time delay or after it has been passed one part of GIT. All enteric coated tablets are type of delayed action tablet but all delayed action tablets are not enteric coated. Enteric-coated tablets are designed to pass unchanged through the stomach to the intestine, where the tablet disintegrates and allow drug dissolution and absorption. Material used for enteric coating includes Cellulose acetate phthalate (CAP), Cellulose acetate trimellitate (CAT), Fatty acid, waxes, shellac, plant fibers etc.
4. **Film coated tablets-** Film coated tablets are surrounded by a thin layer of polymeric material. Film coating process can be done in two ways-

   First is aqueous film coating where generally water is used as a solvent and the second is non aqueous film coating in this generally organic solvent are used. Polymers like hydroxyl propyl cellulose, hydroxyl propyl methyl cellulose and colloidal dispersion of ethyl cellulose are commonly used in forming a skin like film.
5. **Sugar coated tablets-** This type of tablets are coated with a coloured or an uncoloured sugar layer. The coating is water soluble and quickly dissolves after swallowing. The sugar coat protects the enclosed drug from the environment and provides a barrier to unbearable taste or odor.
6. **Chewable tablet-** This kind of tablets are evolved to be chewed in the mouth before swallowing. Chewable tablets have a rapid and smooth disintegration. These have a creamy base, flavored and cololured mannitol. These tablets are especially useful for administration of large tablets to children and people who have difficulty in swallowing solid dosage form.

(B) Tablet used in oral cavity

1. **Buccal and sublingual tablet-** When the tablet is meant for keeping it in the cheek then it is called buccal tablet and those meant for keeping

under the tongue are referred as sublingual tablets. Both of these tablets are designed for retention into buccal cavity for a period. The drug is absorbed directly through the oral mucosa and reaches into gastro intestinal fluids and enzymes. These types of tablet afford rapid onset of action as compared to swallowable tablets.

2. **Dental cones-** As the name implies this specific type of compressed tablets that are meant for placement into empty sockets after tooth extraction. These tablets normally carry antimicrobial drugs with fillers like lactose, sodium chloride, sodium bicarbonate etc.
3. **Lozenges-** These tablets are meant for producing local action on throat tissues and made by compression method. Lozenges are designed to dissolve slowly in the oral cavity providing a prolonged local action of the drug.

(C) Tablets administered by another route

1. **Implant-** These tablets are designed for to provide prolonged drug effect from month to a year. These tablets are small, cylindrical and require special surgical method for implantation and discontinuation of therapy.
2. **Vaginal tablets-** This type of tablet is meant to dissolve slowly in the vaginal cavity releasing the drug over an appreciable period of time. These tablets are having ovoid or pear shaped for ease of insertion.

(D) Tablet used to prepare solution

1. **Effervescent tablets-** These tablets are uncoated tablets and generally contain acid substances and carbonates which react rapidly in presence of water and release carbon dioxide. These tablets are intended to be dissolved in water before use.
2. **Dispersing tablets-** These are no longer in use. Tablets are intended to be added to a given volume of water to produce a solution of a given drug concentration.
3. **Hypodermic tablets-** This type of tablet is added to sterile water to prepare sterile solution which is injectable.
4. **Tablet triturates-** A tablet made by moistening the medication mixed with a powdered lactose or sucrose and then given shape and allowing liquid to evaporate. It usually disintegrates readily.

Tablet ingredients- In addition to drug, tablet contains a number additives for its formulation. These are also known as excipients. The various excipients are-

a. Adsorbents

b. Binders

c. Colouring agents

d. Diluents

e. Disintegrating agents

f. Flavouring agents

g. Glidants, anti-adhesives, lubricants.

(a) Adsorbents- These are the substance that can adsorb fluids like essential oil etc. and remain dry are sometimes used in tablets where good amounts of fluids present. The adsorbents provide free flowing. Magnesium aluminium silicate, Kaolin etc. are used as adsorbents.

(b) Binders- Binding agents are used to form granules or to form cohesive compacts for directly compressed tablet. For granulation solution of adhesive materials like acacia, liquid glucose, gelatin, sucrose syrup etc. are added to appropriate ratio. Binding agents such as amylose, microcrystalline cellulose, spray dried acacia etc. are used in dry granulation. In cases where tablet structures are needed to break up readily the binding agents have to be used at low levels.

(c) Colouring agents- Colour are used to make tablets good looking and these colouring agent should be of permitted list. The colours are added either to the mixture of powder before granulation or to the vehicle used for granulation.

(d) Diluents- Diluents are added as excipients when the proportion of drug is small and it is necessary to increase the bulk to a certain amount so that tablet can prepared. Tablets less than 250 mgm are difficult to handle and intake and therefore addition of a diluent is necessary. Lactose is used

most commonly as diluents. Besides this mannitol and sorbitol are also used.

(e) Disintegrating agents- After ingestion of tablet it is necessary that it easily break down in the gastro intestinal track. For this purpose disintegrating agents are added to tablet formulation. For this purpose corn starch is mot popular. Microcrystalline cellulose, mineral clay, psyllium seed husk powder etc. are used as disintegrating agents.

(f) Flavouring agents- These are added to tablets to increase its palatability. Now-a days flavours are available as spray dried.

(g) Glidants, anti-adhesives, lubricants

Free flow of granules during the manufacturing process is very much needed from hopper into die cavity. Sticking of tablet ingredients to die walls and punches creates problem during operation. To overcome there difficulties these substances (Glidants, anti adhesives or lubricants) are used. However out of these there a single substance may be able to act in all the three capacities. Talcum is most popular and is used for the above purpose. Besides this stearic acid, boric acid etc. are used. Usually for this purpose a combination of two or more substances is used.

Manufacture of tablet

Tablet manufacturing includes the following operations-

1. Size reduction and mixing
2. Granulation
3. Compression
4. Coating

1. **Size reduction and mixing-** The various ingredients should be reduced to same particle size and then uniform mixing is assured.
2. **Granulation-** This process can be done by two method viz dry granulation and wet granulation. In wet granulation the powder is moistened with a suitable liquid binding mixture and lump is made then this is passed through sieve resulting into granules formation. Now these granules are dried before compression. Dry granulation is done by first compressing the dry powder in slug or large tablet. The slugs are then broken up into required granule size by granulator. Dry granulation is also termed as double compression slugging or precompression.
3. **Compression-** The compression of materials into tablets is generally carried out by a machine that stamps out the tablets in a die between punches. Initially hand operated tablet machines were used but now-a-day Rotary type tablet machine are generally used for large scale production. The basic phenomenon involved in tablet compression is-

a) First filling of medicinal material into die with the help of shoe from hooper.

b) The next step is punching of medicinal material within die by means of punch resulting into formation of tablet.

c) In the next process tablet comes out of die by the pushing of lower punch and it came down from the tablet machine by means of shoe and the same time die is filled with medicinal material.

This process in repeated and tablet manufacturing is done. In rotary type tablet machine all are arranged around the circumference of the rotating head. So that it is known as rotary type tablet machine.

4. **Coating-** Two types of coating methods are in common use

a) Pan coating,

b) Press coating

In the pan coating usually the coating is carried out in a rotating tilted, copper pan in which the cascading tablets can be treated with the coating materials.

In press coating a layer of dry coating material is pressed on to a preferred tablet. This process is done by placing the tablet to be coated in the die of tablet machine, in which there is a layer of coating material in granular form, covering the tablet with another layer of coating granules and

comparing to form a layer around the tablet.

Standardization of tablets- The various standards which are considered for this purpose are as follows-

1. Shape
2. Weight of tablet
3. Diameter
4. Mechanical strength
5. Percentage of medicament
6. Rate of disintegration
7. Rate of dissolution

1. **Shape-** The shape of tablet is defined in Pharmacopoeia as circular with either flat or biconvex faces.
2. **Weight of tablet-** The permitted deviation in the weight of tablet is described in the Pharmacopoeia which depends on the size of tablet and the number taken for the test. The percentage deviation in the weight is as follows-

Average weight	Percentage deviation
1. 80 mg or less	10%
2. More than 80 mg and less than 250 mg	7.5%
3. More than 250 mg	5.0%

3. **Diameter-** The pharmacopoeia does not insist on a standard weight, it nevertheless specifies their diameter. The pharmacopoeia permits some slight deviation normally ±5% from the nominal diameter.
4. **Mechanical strength-** No official standards for mechanical strength of tablets have been adopted by pharmacopoeia. Tablet manufactures employ tests to ensure that tablets can withstand the normal risks of transporting and handling. Tests on breaking strength, abrasion tests and penetration tests are done for this purpose.
5. **Percentage of medicaments-** There are many factors mixing of powders, granule preparation etc. variation of dosage between tablet to tablet must occurs no matter how carefully they are prepared. Usually the percentage of medicament on a bulk sample of 20 tablets is required to lie between 90 and 100 percent of the stated value.
6. **Rate of disintegration-** Tablets may remain in the stomach for four hours or more, but the pharmacopoeia normally requires to disintegrate within 15 minutes.
7. **Rate of dissolution-** Since a drug must pass into solution before it can be absorbed, the rate of dissolution is therapeutically more important than its rate of disintegration. Continuous methods have been devised in which water is passed round the tablet in a special cell and solution analysed continuously, usually by spectrographic means.

Pills

Pills are small round shaped dosage form containing medicament and meant to be swallowed. These can be prepared by Pill making machine. These can be compared with the Vati of Ayurveda. Pills generally includes a filler and a plastic substance such as lactose that helps the pills to be rolled by machine or hand into desire form.

Capsule

Capsule can be defined as solid dosage form in which medicine is enclosed in a shell made up of gelatine. This shell is water soluble and biodegradable capsules provide a odourless, tasteless enclosure that is convenient for administration which are otherwise difficult to administer. The capsule consists of two part viz cap and body. Capsules can be of two types-

1. Hard shelled capsules
2. Soft shelled capsules

Hard gelatine capsules

It is basically consists of gelatin, plasticizers and water in addition they may contain

preservatives, opacifying agents, flavours, colours, sugar etc. Gelatin has solubility characteristic in the stomach fluid and absorbs cold water. So this is used frequently. The plasticizers used includes glycerin, sorbitol etc. The proportion of gelation and plasticizers can be determined according to use of capsules and their storage. Although only powders are filled and fixed oils and other liquids that do not permeate thought the wall of gelation can also be filled in the hard capsules. Granules can also be filled easily in the capsules.

Soft gelation capsules

Soft gelatin capsules are primarily used for oils and active ingredients that are dissolved or suspended in oil. However it is possible to fill solid, semisolid as well as liquid into soft gelatin capsules. The composition of soft gelatin capsule shells is that of hard gelation but in soft gelatin a larger proportion of plasticizer is added to make them soft and elastic this type of capsules are available in a variety of shapes the common one is being spherical elliptical and oblong.

Evaluation of capsule is done on the parameters like weight variation, disintegration and dissolution time as well as drug content uniformity.

Varti Kalpana

Varti is solid dosage form having shape similar to Yava i.e. these are thin on both sides and thick in mid region. Varti is said as the synonym for Vati. The reason may be due to similarity in the manufacturing process. For the preparation of Varti the binding agent like Guda or honey is used. Besides these milk water or Gomutra are used for levigation. For example, Chandrodaya Varti is made by levigating it to goat's milk. For the preparation of Varti very fine powder of drugs is used. Varti, according to its application on particular place, is of following types-

1. Guda Varti or Phala Varti (Rectal suppository)
2. Yoni Varti (Vaginal suppository)
3. Netra Varti
4. Dhoomra Varti
5. Vrana Varti
6. Nasa Varti

1. Guda Varti- Guda Vartis are used for Mala Shodhana and Vatanulomana. When Purisha becomes Shushka in the diseases like Udavarta, Aanaha and Arsha, Guda Varti is also known as Phala Varti and is used through anal, vaginal or urethral route. The shape of Guda is described as follows:

श्यामात्रिवृन्मागधिकां सदन्ती गोमूत्रपिष्टां दशभागमाषाम् ।
सनीलिकां द्विर्लवणां गुडेन वर्तिं कराङ्गुष्ठनिभां विद्धयात् ॥
(Cha.Chi. 26/12)

It should be made with fine powder of drugs, Gomutra along with Guda having shape of Varti which has thickness of thumb.

According to Chakradatta-

राठधूमविडव्योषगुडमूत्रविपाचिता ।
गुदेऽङ्गुष्ठसमावर्तिंविधेयाऽऽनाहशूलनुत् ॥
(Anaha. Chi. 07)

It should be made having thickness of thumb.

According to Ayurvedic formulary of India Varti should be made into thin sticks of about 2 centimetres in length and dried in shade.

Method for use

हिङ्गुमाक्षिकसिन्धूत्थैः पक्त्वा वर्त्तिं सुनिर्मिताम् ।
घताभ्यक्तां गुदे दद्यादुदावर्त्ते विनाशिनीम् ॥
(Chakra. Udavarta 12)

Varti should be inserted into rectum after Ghrita is smeared on the surface of rectum as well as on Varti. It should be inserted slowly.

क्षुण्णं निर्गुण्डी पत्रं वा स्विन्नेपायौक्षियेत् बुधः ।
(Chakra. Udavarta 14)

or before inserting Swedana of rectum may be done.

2. Yoni Varti- These Vartis are used in the disease of Yoni. The length of Yoni Varti is equal to length of index finger as follows:

पिप्पल्या मरिचैर्माषैः शताह्वाकुण्ठसैन्धवैः ।
वर्तिस्तुल्या प्रदेशिन्या धार्या योनि विशोधनी ॥
(Ch. Chi. 30/72)

Varti having size equal to index finger and

made up of Pippali, Marich, Masha, Shatahya, Kushtha and Saindhava Lavana is used for Yoni Vishodhani.

3. Vrana Varti- Vrana Vartis are used in Nadi Vrana, Wounds filled with pus having pain and inflammation. In these Vrana Vartis are used for Shodhana and Ropana. For example, Nimbadi Varti.

निम्बपत्र घृत क्षौद्रदार्वीमधुक संयुक्ता।
वर्तिस्तिलनां कल्को वा शोधयेद्रोपयेद् व्रणम्॥
(Charka.Vrana. 35)

Varti made up of Nimba Patra, Ghrita, Madhu, Daruharidra or Tilkalka works as Shodhana and Ropana.

4. Netra Varti- Netra Vartis are used as these are rubbed with any liquid and then applied into eyes. These are rubbed according to quantity (dose) indicated. Dose of Netra Varti is as follows-

छागी क्षीरेण संपिष्य वर्तिं कृत्वा यवोन्मिताम्।
हरेणु मात्रां संघृष्य जलैः कुर्यादथाञ्जनम्॥
(Sha.Utt. 13/76)

Yavakar Varti is made by levigating powdered drugs with Goat's milk. Then it is rubbed over clean surfaces for Harenu Matra with water and then it is applied into eges.

5. Dhooma Varti- This Vartis is used in Urdhvajatrugata Vikara like Peenasa, Manya Stambha, Shirahshoola and Mukha Roga etc. as well as Vata Kaphaja Roga. These are wet with Sneha and then used by Dhooma Netra.

6. Nasa Varti- These are used for Nasagata Roga. This Varti is made up of Tikshna Dravya like Vidanga, Maricha, Apamarga etc.

Suppositories

Suppositories are used from very ancient times. Suppositories can be defined as medicated solids of various shapes and size suitable for insertion into one of the body orifices like rectum, vagina etc. other than oral cavity. The dosage form that are prepared for insertion into rectum are referred as suppositories while others that are meant for introduction into urethra, vagina and nasal caving known as urethral bougies, pessaries and nasal bougies respectively. Suppositories normally carry the medicine falling under category of emollients, antiseptics, astringents and local anaesthetics designed to exercise local action at the site of placement. The advantage of using suppositories is that in this form portal circulation is by passed and biotransformation of drug in liver is restarted. Some documents also indicates that absorption of some drug through the rectal mucosa could be faster than oral rout while for some drug it is slower.

In the formulation of suppositories besides the medicament the base is very important. The base used in the preparation can be of following types-

1. Oleaginous 2. Water soluble

Oleaginous base

Cocoa butter is used as a suppository base as it remains solid at room temperature and melts readily at body temperature. However, it has some draw backs like rancidity, leakage from body cavity, melting in very warm weather etc. Different suggestion for base using in the preparation of suppositories includes hydrogenated palm oil, hydrogenated cotton seed oil such as 'Cotoflakes', mango fat and edible hydrogenated fat (Dalda).

Water soluble base included gelato-glycerin mixtures, soap glycerin, polyethylene glycols and water dispersible bases.

Preparation method : The suppositories can be manufactured by hand moulding, machine moulding, pour moulding or by compression. In all manufacturing procedure the objective is production of uniform weight and amount of medicament in each suppository.

Size and shape of suppositories- The suppositories are in different size and shapes according to use in the different body cavities. The common types are-

(a) Rectal suppositories- These are meant for placing into rectum and normally weigh 1 to 2 grams, these are either torpedo or cone shaped.

(b) Vaginal suppositories-These are also known as pessaries and are meant for insertion into vagina. They are generally wedge or cone shaped and weigh either 4 gram or 8 grams.

(c) Urethral bougies- These are intended for introduction into urethra. They are thin and cylindrical in shape having weight usually 1 gram and length is about 8 cm.

(d) Nasal bougies- There are meant for insertion into nasal cavity and having length of 9 to 10 cms and weight about one gram. These bougies are always made with gelato-glycerin base.

12 HAPT.

Chaturvidha Rasayana

Syllabus

Introduction, definition, importance, types, Procedure, necessary equipment, Shelf life with following example.

Kharaliya Rasayana: Shwasakuthara Rasa and Vatavidwansanarasa
Parpati Rasayana: Loha Parpati and sudhaparpati
Kupipakwa Rasayana: Rasasidhura and Rasakarpura
Pottali Rasayana: Tamragarbha Pottali and lohagrarbha Pottali

Learning objective

1. Describe importance and unoque features of ChaturvidhaRasayana - Kharaliya Rasayana, Parpati Rasayana, KupipakwaRasayana & Pottali Rasayana.
2. Explain definition, types and method of preparation ofChaturvidha Rasayana.
3. Determine role of Yantra, Agni & Kala for pharmaceuticalprocess of chaturvidhaRasayana.
4. Explain shelf-life of Chaturvidha Rasayana.
5. Describe chemical changes occurring during the preparation ofchaturvidharasayana and its impact on Pharmacological actionof Chaturvidha Rasayana.
6. Explain law of Definite proportion and proportion of Mercuryand sulphur needed for preparation of sulphide of Mercury in ChaturvidhaRasayana.

Total -08 hours (Lecture :04 hour, Non-lecture: 04 hours)

Marks- 10 marks, LAQ (10 Marks)- Yes, SAQ (5 Marks)-Yes, MCQ- Yes

Chaturvidha Rasayana

Chaturvidha Rasayana or Rasayana word used for whole group of medicine having mercury or another mineral in them. All Rasa Kalpas contain Parad and Gandhaka. For example Cinnabar as a compound has been used in traditional medicines for thousands of years as an ingredient in various medicine. Such these traditional medicines are still in use today.

Specific qualities of Rasaoushadhi are the various substances are used in formulation they are converted in to micro size. Due to metal, mineral presence in formulations they are more efficacious and quick acting in small dose. Rasaoushdhi show their therapeutic and Rasayana efficacy. Shelf life of Rasaoushdhi is more. But here Rasaoushdhi are prepared after proper purification procedure. The substances are subjected to different standard procedures.

Based on their procedure in Rasashastra we will get few Rasayanas,

Classification

1. Kharaliya
2. Parpati
3. Kupipakwa
4. Pottali

Kharaliya Rasayana

Introduction

Parad and Gandhaka and / or herbs or minerals / metals ingredients are ground together in a mortar

Khalva to produce a finely powdered drug. as per the terminology of Ayurveda, the formulation is known and classified as Kharaliya Rasayana.

Kharaliya Rasayana got importance the mercury and other ingredient of the formulation are grinded in mortar known as Khalva hence termed as Kharaliya Rasayana. The speciality of Kharaliya Rasayana lies in binding different varieties of drug in to single molecular form and minimizing dose and more effective in action. Khalvi Rasa Kajjali contains mercury & Sulphur / herbs / mineral / metal ingredients are ground together in a mortar to produce a finely powdered drug. Rubbing between surfaces of mortar and pestle i.e., surface phenomena, some heat is produced so, there may be possibility of occurrence of chemical reaction in between materials and media. New and desired qualities may be produced by such reaction. In the Rasashastra mentioned the procedures to Rasa Kalpas used Khalvi Rasayana in control the unsteadiness of mercury. Kajjali is key ingredient. Main role of Kajjali as a Rasayana drug. Kajjali is prepared from one part purified Parad and one part purified Gandhaka.

Procedure

1. Collection of raw material (Rasadravya, Vanoushadhi, Bhavana Dravya)
2. Kajjali Nirmana
3. Mixing of all ingredient
4. Bhavana
5. Ready to use in form of Vati, Guti, etc.

Khalva Yantra which includes both mortar & pestle, is used for triturating / pounding different types of herbal and mineral drugs. It is an instrument made up of good quality of stone in different shapes & size useful for trituration used for grinding, powdering & mixing medicine.

Importance-

1. Prolonged shelf life of formulation
2. Increase therapeutic efficacy
3. Decrease dosage
4. Decrease duration of treatment

Kharliya Rasayan is the main foundation for most of the Rasaoushadis. Kajjali plays an important role in this, it has Ushna Guna and Katu Vipaka which acts as Yogavahi and Tridoshghana.

Necessary equipment-Khalva Yantra

Shelf life- 5 years

Shwasakuthara Rasa (Ref A.F.I. Part I 20:49)

रसो गन्धो विषं चैव टंकणं च मनःशिला।
एतानि टंकमात्राणि मरिचं चाष्टटकंकम्॥
एकैकं मरिचं दत्वा खल्वे सूक्ष्मं विमर्दयेत्।
त्रिकटुटंकमात्रं च दत्वा पश्चाद्विचूर्णयेत्॥
सर्वमेकत्र संयोज्य काच कूप्यां विनिक्षिपेत।

Ingredients-

1. Shuddha Parada	-	4 gm
2. Shuddha Gandhaka	-	4gm
3. Shuddha Vatsnabh	-	4 gm
4. Shuddha Tankana	-	4 gm
5. Shuddha Manashila	-	4 gm
6. Maricha	-	36 gm
7. Shunthi	-	4 gm
8. Pippali	-	4 gm

Method of Preparation- All the ingredients are taken in a Khalwa Yantra and mixed well.

Dose : 125 mg

Anupana/Sahapana- Honey

Therapeutic Use- Kasa, Shwasa, Vata Kaphaja Roga, Kushta, Vata Roga,

Vatavidhwansa Rasa

रसं गन्धकं नाग वंगं च लौहं तथा ताम्रजं व्योम निश्चन्द्रकं च । कणा टंकणं त्र्यूषणं नागरं वै पृथग्भागमेकं विमर्द्यैकयामम् ॥1॥

ततो वत्सनाभं चतुः सार्धभागं दृढं मर्दयेत् भावना व्योषजात्रिः । वराचित्रकैमार्कवैः कुष्ठजाम्दिस्त्रिभिर्भाव-येन्निर्गुण्डी भानुदुग्धैः ॥2॥

महीधात्रिका चन्द्रिकानिम्बुनीरैः समं भावयेद्वातवि-ध्वंसनोऽयम् । (Yog.Rat.Vata page 468-469)

Category Kharliya Rasa

Ingredients

1. Shuddha Parada	-	1 Part
2. Shuddha Gandhaka	-	1 Part

3. Naga Bhasma	-	1 Part
4. Vanga Bhasma	-	1 Part
5. Lauha Bhasma	-	1 Part
6. Tamra Bhasma	-	1 Part
7. Abhraka Bhasma	-	1 Part
8. Pippali	-	1 Part
9. Shuddha Tankana	-	1 Part
10. Shunthi	-	1 Part
11. Maricha	-	1 Part
12. Pippali	-	1 Part
13. Shunthi	-	1 Part
14. Shuddha Vatsnabha	-	41/2 Part

Bhavana Dravya

1. Trikatu Kwatha
2. Triphala Kwatha
3. Chitraka Swarasa
4. Bhringaraj Swarasa
5. Kushtha Swarasa
6. Nirgundi Svarasa
7. Arka Dugdha
8. Tamalaki Swarasa
9. Chandra shoora seed Kwatha
10. Nimbu Swarasa

Method of preparation : Kajjali is made by taking Parada and Gandhaka and then the rest of the ingredients are mixed well. Three Bhavana of each drug is given to it and Vati is prepared.

Dose : 250 mg

Anupana : Honey

Therapeutic uses : Vataja Shoola, Vataja Grahani, Kaphaja Roga, Sutika Vata, Grahani, Sannipataja Roga.

Parpati Rasayana

Introduction

The Sanskrit word "Parpati" denotes a thin flake like preparation. "Parpati" indicates a preparation which is thin, brittle and has a shape of thin Papad.

In the Rasendra Mangal written by Acharya Nagarjuna there is preparation of Parpati by using the ingredients Parada, Gandhaka, Tamra and Visha. It is used in Kushtha Roga. But the period of this classic is not fixed otherwise we can say that use of Parpati begins in eight century A.D. In the eleventh centaury A.D. Classic namely Chakradatta written by Aacharya Chakrapani Rasa Parpati is used in the treatment of Grahani.

रस पर्पटिका ख्याता निबद्धा चक्रपाणिना।
(Chakra. Grahani Chiki.)

श्रीवत्साङ्क विनिर्मितसम्यक् रसपर्पटिका श्रेष्ठा ।
(B.R. Grahani 4/2)

It is quoted in other classics like Vangasen, Rasa Ratna Samuchchaya, Rasendar Sara Sangrah etc. Bhaishajya Ratnavali has said that it is prepared by Aacharya Vatsnak. viz.

Definition

सन्द्रावित कज्जलिकाग्नि योगात्।
रम्भापलाशे चिपटी कृता च।
रसागमज्ञैः खलु पर्पटी सा, प्रकीर्तिता पर्पटिका च सैव ॥
(R.T. 2/42)

द्रुत कज्जलिका मोचापत्रे चिपटीकृता च।
स पोटः पर्पटी सैव बालाद्यखिलरोगनुत् ॥
(R.R.S. 11/72)

Kajjali is melted on fire and it is dropped on Banana leaf and made into flatten then flake form (Papad) then it is termed as Parpati or Parpatika by the scholars of Rasa Shastra. Parpati is Pota Bandha of Parada and is capable of mitigating all the diseases of Bala etc.

Types- On the basis of presence or absence of Gandhaka Parpati can be of two types.

1. Sagandha Parpati 2. Nirgandha Parpati

1. Sagandha Parpati

In these types of Parpati Parada and Gandhaka are present. Besides these two other ingredients may be present. According to specific Dravya like Tamra, Svarna etc. these are named. For the preparation first we have to made Kajjali and then Bhasmas are added.

a) When only Parada and Gandhaka present Rasa Parpati

b) Parada + Gandhaka + Tamra + Vatsnabha Tamra Parpati
c) Parada + Gandhaka + Svarna Svarna Parpati
d) Parada + Gandhaka + Lauha Lauha Parpati
e) Parada + Gandhaka + Abhraka (Gagan) Gagan Parpati
f) Parada + Gandhaka + Lauha + Abhraka + Tamra Panchamrita Parpati
g) Parada + Gandhaka + Bola Churna - Bola Parpati

2. Nirgandha Parpati

a) Suryakshara + Sphatika + Nausadar Sweta Parpati
b) Malla Parpati

Procedure

निर्धूमबदर काष्ठाङ्गारे न्यस्तं विलाप्य तैलसमम।
(B.R. Grahani chi. 384)

ततो बादरबह्निस्थं लोहपात्रे द्रवीकृतम्।
(Chakra. Grahani. 87)

Kajjali melt on temperature 119-1200C so this temperature range is needed for Parpati preparation. If temperature is higher than this and having flame then there is chance of burning of Kajjali. Badar wood coal are having temperature of this range so this is recommended in classics. Nowa days in small quantity Parpati can be made with LPG burner on sim mode.

Parpati Paka Pariksha

Parpati can be of three types depending upon Paka :

1. Mridu Paka
2. Madhya Paka
3. Khara Paka

Parpati Paka examination can be catagorised under two headings

1. Paka Kaleen Pariksha (Examination during preparation)
2. Paka Pashchat Pariksha (Examination after preparation)

On the basis of appearance of melted Kajjali the assumption is made that which type of Parpati will be formed. It is as follows

Mridu Paka

मयूर चन्द्रिकाकारं लिङ्गं यत्र तु दृश्यते।
तत्र सिद्धिं विजानीयात मृदुनैवात्र संशयः॥
(Bha. Bhai. Rat. IV part, Rakardi 6063)

If melted Kajjali is having colour similar to Mayurchandra then Mridu Paki Parpati should be formed.

Madhya Paka

तावत् स्थाप्यते यावत्तैलाभो जायते रसः।
(Tamra Parpati, Takardi, Ras. Yog. Sag. II part)

It is Tailabha then prepared Parpati will be Madhya Paki.

Khara Paka

रक्तवर्ण भवेद् यावत् तावत्पाच्यं प्रचालयेत।
(Bha. Bha Ratna. IV part Rakardi 6154)

If melted Kajjali becomes Rakta Varna then formed Parpati will be Khara Paki.

It can be summarised as follows :

Melted Kajjali form/Varna	Paka type
Mayur Chandrika Varna (like peacock feather)	Mridu
Tailabha (oily consistency)	Madhyama
Rakta Varna (Reddish colour)	Khara

Paka Pashchata Pariksha (Examination after preparation)

पाकोऽस्यास्त्रिविधः प्रोक्तो मृदुर्मध्यः खरस्तथा।
आद्ययोर्दृश्यते सूतः खरपाके न दृश्यते॥
मृदौ न सम्यग् भङ्गोऽस्ति मध्ये भङ्गश्च रौप्यवत्।
खरेऽलघुर्भवेद्भङ्गो रुक्षः श्लक्ष्णोऽरुणच्छविः॥
मृदुमध्यौ तथा आद्यौ खरसत्याज्यो विषोपमः॥
(Pancha. Parrpati I, 172-73 Ras. Yog. Sag. II)

मृदुपाके न भगः स्यात्तत्सारल्यञ्च मध्यमे।

द्वयोः सचन्द्रिकं काष्ण्यं खरे चूर्णञ्च लोहितम् ॥
(R.T. 6/139)

Paka Pashchata Pariksha can be performed by breaking of Parpati. In the Mridu Paka Parpati does not break but it bends while in Madhya Paka it breaks easily and both of these are black colour having Chandrika. Khara Paka Parpati is having Rakta Varna and in Churna form. Mridu and Madhya Paka used as medicine.

Necessary equipment

1. Khalva Yantra
2. Lauha Darvi
3. Table spoon
4. Gomaya
5. Kadali Patra (Other Patra may be taken)
6. Flat Pidhanaka (Base)
7. Sneha (Ghrita)
8. Heating device

1. **Khalva Yantra :** This Yantra is needed for the preparation of Kajjali and proper mixing of all the ingredients. Various types of Khalva Yantra can be used according to convenience.
2. **Lauha Darvi :** It is used for the melting of Kajjali. Depending upon the amount of Kajjali taken for melting it can be of big or small size. Now-a-days stainless steel made Darvi (Laddle) can be used. In the classics Darvi made up of Lauha and Tamra are indicated.
   1. लौहपात्रेऽथवा ताम्रे - Yakarati Rasa, Shloka 354 Part II Ras. Yog. Sag.
   2. लोहपात्रे द्रवीकृतम् - Chakradatta Chi. 87
   3. लौह स्थितं यत्नेन - Bhai. Rat. Grah. Chi. 384
3. **Spoon :** Table spoon can be used during the melting of Kajjali and shifting of melted Kajjali to the Kadali Patra.
4. **Gomaya :** It is used during pressing of melted Kajjali. Kajjali should be pressed between Gomaya.
   1. शीघ्र गोमयसंस्थिते तु कदली पत्रे ततो निक्षिपेत (R.T. 6/136)
   2. गोमयोपरि विन्यस्त कदली पत्र पातनात् (Chakra. Grahani 87)
   3. सद्यो गोमयनिहिते कदलदले दालयेन्मृदुनि (B.R. Grahai. 385)

   There is indication of Mud in place of Gomaya also.

   समविनिहितपङ्कस्थायिरम्भादलस्थम् - Panchamrit Parpati, Yakradi rasa 208, Ras. Yog. Sag. II part.
5. **Patra :** Normally Kadali Patra (Banana leaf) is used for the spreading of melted Kajjali. However various other Patra like Palash, Kamal, Nagavalli etc. can also be used in various Parpati preparation.

   1. प्रथमं कदली श्रेष्ठा ह्यलाभे पद्मिनी दलम् ।
      तद् लाभे नागवल्ली ॥
      (Tamra Parpati, Takarddi Rasa 57-58, Ras. Yog. Sag.II)
   2. ढालयेत अर्कपत्रस्था पर्पटी रससिद्धये ।
      (Tamra Parpati, Takarddi Rasa 67, Ras. Yog. Sag.II)
   3. तत् सर्वं क्षिपेत् कुटज पत्रके
      (Sudhakar Rasa, Shakaradi Rasa 1878) Ras Yog. Sag.I.)
   4. पञ्चाङ्गुलदले क्षियेत
      (Abharaka Parpati, Akaradi Rasa, Rasa. Yog. Sag. I)
   5. रम्भापलाशे चिपटी कृता च (Ras. Tar. 2/42)
6. **Samtala Pidhanaka :** It is used as plane surface for keeping of Kadali Patra and pressing so that proper shape can be achieved.
7. **Sneha :** It is used for the non-sticking of Kajjali to the Darvi so that Kajjali should not burn.

   किञ्चित् क्षिपेत्तैलमतश्च बह्नौ प्रदाव्य
   (Rasa Parpati, Yakaradi 356 Ras. Yog. Sag. II)

   घृताक्तं लौहपात्रेऽग्नौ द्रुतत्वादिकतागतम्
   (Abhraka Parpati, Akaradi Ras. Yog. Sar. I)
8. **Heating Devices-** Nowa days in small quantity Parpati can be made with LPG burner on sim mode.

Shelf life- 10 years

Loha Parpati (Ref. A.F.I. Part I 16:4)

रसभागो भवेदेको द्विगुणः शुद्ध गन्धकः।
रसतुल्यं तीक्ष्णभस्म कज्जली कारयेच्छुभाग॥
रसपर्पटिका प्रोक्ता विधानेन प्रयत्नत।

Ingredients-

1. Shuddha Parada - 1 Part
2. Shuddha Gandhaka - 2 Parts
3. Tikshna Lauha Bhasma - 1 Part

Method of Preparation- Kajjali is prepared with Parada and Gandhaka then Tikshna Lauha Bhasma is mixed into it properly. Parpati is made by Parpati Nirmana Vidhi.

Dose- 125-250 mg

Anupana- Takra, Bhrasta Jeeraka, Dadima Swarasa

Therapeutic Uses- Agnimandya, Grahani, Amlapitta, Pandu etc.

Sudha Parpati

प्रवालं स्फटिकं मुक्ता तथा जहरमोहरा।
तेषां पिष्ट्यो रौप्यभस्म ताप्यभस्म पृथक् पृथक्॥
पंचकर्षो रसः पंचत्रिंशत कर्षमितः स्मृतः।
गन्धः सप्ततिकर्षः स्यात् कज्जलीकृत्य मेलयेत्॥
पर्पटी विधिना कार्या रम्भगोमययोगतः।
द्राक्षा कुस्तुम्बरूःकंग्याख्यनिम्ब श्वेत चन्द्रनम्॥
निम्बो जनच्छली तेषां रसै सम्यग् विभावयेत्।
सिद्धा सुधापर्पटीयं रक्तपित्त द्विमार्गगम्॥

Ingredients-

1. Pravala Pishti
2. Sphatika Pishti
3. MotiPishti
4. Jaharamohra Pishti
5. Rajata Bhasma
6. Swarna Makshika Bhasma
7. Shuddha Parada
8. Shuddha Gandhaka

Bhavana Dravya :

1. Draksha
2. Dhanyaka
3. Nimba
4. Shweta Chandana
5. Anjana

Method of Preparation- Kajjali is prepared with Parada and Gandhaka then Bhasma and Pishti is mixed into it properly. Parpati is made by Parpati Nirmana Vidhi. After that it is powdered and Bhawana of each Dravya is given. After that it is dried and stored.

Dose- 125-250 mg

Anupana- Ghee, butter, honey

Therapeutic Uses- Rakta pitta, Pradara, Yonisrava, Jirna Jwara etc.

Kupipakwa Rasayana

Introduction- In the sequence of Gandhaka Jarana Kupi Pakwa Rasa has been developed. In this method Gandhaka Jarana has been done in Kupi by using Yantra like Baluka or Sikta Yantra. Aacharya Yashodhar Bhat in thirteenth centaury A.D. has described Udaybhaskara Rasa by using Kachghati.

रुचिरकाचघटीविनिवेशितौ सिकतायन्त्रवरेण दिनत्रयम्।
कुरु भिषग्वरबह्निमधस्ततः स च भवेदरुणः कमलच्छविः।
उदयभास्करनामरसो ह्ययं भवति रोगविघातकरः स्वयम्॥
(Ras.Pra.Sudha 3/10-14)

The Paka is done by using Kacha Ghati and Sikta Yantra for three days and when bottom of Kupi looks like colour of lotus flower then heating is stopped. After self-cooling the Rasa obtained is known as Udaybhaskar Rasa which is capable of mitigating the diseases.

Definition- Kupi Pakwa can be defined as follows :

Kupi = Kancha Kupi

Pakwa = Agni Pakwa

Rasa = Parada

Ayan = Place

Kupi Pakwa is that in which the Paka of Parada is done by keeping it into Kacha Kupi and then placing it into Agni.

Types

On the basis of ingredients, it can be of two types :

a) With the presence of Gandhaka and other Dravyas

Parada + Gandhaka Rasa Sindoora

Parada + Gandhaka + Svarna Makardwaja and Siddha Makardwaja

Parada + Gandhaka + TamraTamra Sindoora

Parada + Gandhaka + Vanga + Nausadara Svarna Vanga

b) With the presence of Gandhaka and Uparasa/ Sadharana Rasa

Parada + Gandhaka + Hartala Tal Sindoora

Parada + Gandhaka + Manhashila Shila Sindoora

Parada + Gandhaka + Malla Malla Sindoora

Parada + Gandhaka + Hartala + Manhshilla + Malla Sameerpannaga

c) Without Gandhaka

Parada + Kasisa + Saindhava lavana Rasa Pushpa

Parada + Gandhakamala + Saindhava lavana Rasa Karpoora

On the basis of place from where it is collected

a) Galastha (from neck portion of Kupi)

Rasa Sindoora, Malla Sindoora, Rasa Pushpa, Rasa Karpoora

b) Talastha (From bottom part of Kupi)

Svarna vanga, Sameer Pannaga

c) Ubhayastha (From both neck as well as bottom)

Makardwaja, Siddha Makardwaja

Procedure

It can involves the following steps :

1. Preparation of Kupi wrapped with mud smeared cloth.
2. Filling of Kajjali to Kupi.
3. Placing of Kupi into Baluka Yantra/EMF
4. Application of Heat
5. Observation for Siddhi Lakshana.
6. Corking of Kupi mouth
7. Self cooling
8. Breaking of Kupi
9. Collection of product

1. **Preparation of Kupi :** The Kupi which is used for the preparation of Kupi Pakwa should be wrapped for seven times by cotton cloth smeared with Multani Mitti. For this first one layer is wrapped over the Kupi and when it is dried then another layer should be wrapped till seven layers are completed when it is completely dried it should be used.
2. **Filled of Kajjali :** The next step is filling of Kajjali into the Kupi. For the convenient filling one can used plastic keep. Kajjali should only be filled when it is complete dry after Bhawana.
3. **Placing of Kupi into Baluka Yantra/EMF :** After filling of Kajjali to the Kupi it is placed into Baluka Yantra or vertical electric muffle furnace. In Baluka Yantra Kupi should placed after placing sand having one inch thickness.
4. **Application of Heat :** Heating process in the preparation of Kupi Pakwa is very unique. It is given in increasing order i.e. Mridu, Madhyama and Tivra fashion. The average temperature range and time for these pattern is as follows :

   a. Mridu Agni 0^0-200^0C for 4 hours

   b. Madhyam Agni 20^0-400^0C for 4 hours

   c. Tivra Agni 40^0-630^0C for 4 hours

   Kajjali melts on Mridu Agni and Sulphur fumes comes out to this stage of heating. At the Madhyam Agni the flame of Sulphur comes out and product (Rasa Sindoora) is formed. While at Tivra Agni flame disappears and sublimation takes place. There are some other Kupi Pakwa in which the above pattern is not followed.

   Rasa Pushpa and Rasa Karpoor Only Mridu Agni is given Svarna Vanga Maximum temperature around 420^0C is given.
5. **Observation for Siddhi Lakshana :** When flame of Gandhaka is disappeared the following. Siddhi Lakshana are observed

before corking of mouth of Kupi.

a) **Red bottom :** The bottom of Kupi looks like Bal Aruna (Rising Sun)

b) **Sheeta Shalaka test :** Sheeta Shalaka is inserted into Kupi carefully and taken out it looks grey in colour showing mercury deposition.

c) **Coin test :** When a coin is place over mouth of Kupi and it is replaced then free mercury adhere to it.

d) **Honey comb :** The bottom of Kupi looks like honey comb.

6. **Corking of Kupi :** When Siddhi Lakshana appeared then mouth of Kupi is corked and temperature around 6300C is given for 35-40 minutes after this heating is stopped in case of EMF.
7. **Self-cooling :** When the Kupi is self-cooled on next day it is taken out from Baluka Yantra/ EMF.
8. **Breaking of Kupi :** Kupi is break to collect the product. For this purpose, jute tread is dipped with Kerosene oil is wrapped to Kupi and it is burnt when it becomes hot then it is wrapped with wet cloth. By doing so Kupi breaks easily.
9. **Collection of products :** After breaking of Kupi product is collected carefully avoiding glass particles.

Necessary Equipment

1. **Kupi-**

   काच मृत्तिकयोः कूपी हेम्नोऽयस्तारयोरपि ।
   कालालायस्कृतो लेपः खटिकालवणाधिकः ॥
   (A.P. 1/194)

   Kupi made up of Kach (Glass), soil, Various metals like Svarna, Rajat, Loha etc. can be used. We in our Guru tradition used brown coloured bottle for the preparation.
2. Cotton cloth and Multani Mitti It is used for covering of Kupi for seven times so it becomes more thermolabile.
3. Vertical Electric Muffle Furnace or Baluka Yantra.
4. Kupi Stand : For the preparation of Kupi.
5. Shalaka : It is of two types

   Hot Shala : It is of having thickness of half centimetre diameter made of iron. It is used for excessive burning of Sulphur deposited around the neck of Kupi during the process.

   Sheeta Shalaka : It is used to see the Gandhaka Jeerna stage. For this purpose, we can use thin rods of bicycle wheel.
6. Khalva Yantra : For the preparation of Kajjali.
7. Coin : To see the free mercury
8. Mudra : For the corking of Kupi mouth after the completion of process.

Shelf life- 10 years

Rasa Sindura

तोलकाष्टकमितं रसेश्वरं तन्मितञ्च विमलं बलिं हरेत् ।
खल्वके खलु विमर्द्य कज्जलीं भावयेदथ वटाङ्कुराम्बुभिः॥
मषीमापात्रसमाकारं सुकृष्णां काचकूपिकाम् ।
सतूलकुट्टितमृदा लेपयेत् खलु यत्नतः ॥
स्थापयेत्कज्जलीं काचकुप्यां ततो यत्नतः पाचयेद्वालुकायन्त्रगाम् ।
अग्निवृद्धिक्रमैर्जीर्णगन्धे रसे रोधयेद्युक्तिः काचकूपी मुखम् ॥
बालुकायन्त्रके काचकूपीमुख्यात् रोचनासन्निभो नैति धूमो यदा ।
सूतपाक क्रियाज्ञानदक्षैर्वुधैर्वेदितव्यस्तरा जीर्णगन्धो रसः ॥
निवेश्य कुप्यां खटिकाविधानं जलेन सम्पेषितया प्रकामम् ।
प्रलेपयेद्वै गुणचूर्णपिष्टया ततः पचेद्यामयुगं रसज्ञः ॥
अवबुध्य तदंग शीततां खलु बालारूणसूर्यसन्निभम् ।
गलदेश विलग्नमुज्जवलं रस सिन्दूरमिहाहरेद् बुधः ॥
(R.T. 6/162-163)

Ingredients-

1.Suddha Parada - 8 Tola

2.Suddha Gandhaka - 8 Tola

3.Vatankura Swarasa - Q.S.

Yantra -Baluka Yantra

Procedure - Kajjali is prepared by taking Parada and Gandhaka and Bhavana of Vatankura Swarasa is given. Then Kajjali filled in a Kach kupi having size of Ink pot which has having seven

layer of Kapad mitti (Cloth smeared with mud) over it. Now the Kupi is placed into Baluka Yantra and heating is done in Mridu, Madhya and Tivra fashion till the Gandhaka is Jirna. When Gandhaka is Jirna and fumes having colour of mixed Yellow. Red then corking is done to the mouth of Kach Kupi. For the purpose of corking Khatika or Ishtika cork smeared with Jaggery and lime water is used. After corking the heating for four Yama is done. When it is self-cooled then Rasa Sindoora having Red colour similar to rising Sun is collected from neck part of Kupi.

Rasa Karpura

पलसंमितं प्रयत्नाद् विमलीकृतं रसेशम्।
सपलार्द्धकं पलैकं विमलं च गन्धकाम्लम्॥
चषकोपमे विशुद्धं निदधीत कांच पात्रे।
विनिधाय काच पात्रं त्वयसस्त्रिपादिकायाम्॥
ज्वलिते सुराप्रदीपे संशोषयेज्जलांशम्।
अथशोषिते तु चूर्णे त्ववातार्य वै प्रदीयात्॥
समभागिकं दद्याल्लवणं तु सैन्धवाख्यम्।
परिमैल्य चूर्णमेतन्निदधीत काचदुप्याम्॥
युग संख्यकैस्तु यामैः सिकताख्ययन्त्रसंस्थम्।
विपचेदतिप्रयत्नात् रसतन्त्रकर्मविज्ञः॥
अबबुध्म काच कूपीं स्वत एवं शीतलांजीम्।
विपचेदतिप्रयत्नात् रसतन्त्रकर्मविज्ञः॥
अवबुध्य काच कूपीं स्वत एवं शीतलांजीम्।
धनसारनामधेयं रसमाहरेद्रसज्ञः॥
जलीय वाष्पे निर्याते विधानेन विधापयेत्।
कूपी कण्ठास्थितां स्वल्पां सिकताञ्चापसारयेत॥

(र.त. 6/65-71)

Ingredients-

1. Shuddha Parada - 48 gm
2. Gandhakamla - 72 gm
3. Saindhava Lavana- Equal to that amount of residue which is obtained after heating of Parada and Gandhakamla.

Method of Preparation- Shuddha Parada and Sandra Gandhakamla are kept in a flask. This is heated over fire till water evaporates. Thereafter Saindhava Lavana is added to equal amount of residue which is obtained after heating of Parada and Gandhakamla. Now it is filled in Kupi (Kapadmitti Yukta) and it is placed in Baluka Yantra and Paka is done. Rasa Karpura is deposited in the neck of Kupi as a result of sublimation. After self-cooling Kupi is taken out from Baluka Yantra and by breaking of Kupi Rasa Karpura is obtained.

Note- The decompactions temperature of Rasa Karpura($HgCl_2$) is 138^0C so it should be prepared very carefully and temperature should not exceed to this.

Dose- 2-4 mg

Anupana- Twak Churna,

Therapeutic uses- Krimi, Twak Roga, Phiranga, Vrana Mandala Kushtha etc.

Pottali Rasayana

Introduction

Pottali Kalpana is also a type of Murchchhana in which Parada, Gandhaka and other ingredients like mtals etc. are being subjected to Paka process. However the Pottali can be made by doing Agni Samyoga or without Agni Samyoga. In Pottali Kalpana the ingredients are made into a compact form for easy administration. Pottali first time prepared by Puta paka method is available in Rasa Ratnakar. Gandhaka Drava Paka method is described by Rasa Prakash Sudhakar and other texts. Normally Pottalis are of Pugakar shape but it may be of Puga matra Gutikritva or Karsha mana Varatika. Hamsa Pottali is made without Agni Samyoga.

Definition

विस्तारितस्य वस्तुतः अल्पो भवनं पोट्टम्।
पोट्टलति गृह्णति इति पोट्टली॥

(Para. Vig. P 168)

Expanded things are when concise and collected into small size then it can be termed as Pottali.

Importance- Pottali Kalpana is type of Gandhaka Murcchana and the dose is very less. Pottali Kalpana are used after rubbing it then

mixing it with suitable vehicle. These can be used in emergency conditions and can be transported easily.

Types- According to Paka it can be of following types-

1. Puta Paka
2. Bhavana
3. Dugdha Paka

Pottali	Process	Reference
Ratna Garbha Pottali	Puta Paka	Rasa Ratnakar
Shankha Garbha Pottali	Puta Paka	Rasa Ratnakar
Hema Garbha Pottali	Puta Paka	Rasendar Sar Sangrah
Hamsa Pottali	Bhavana	Rasendar Sar Sangrah
Hema Garbha Pottali II	Hema Garbha Pottali II	Rasa Prakash Sudhakar
Lokeshwar Pottali	Puta Paka	Rasendra Chintamani
Hema Garbha Pottali I	Kapard Poorna Putapaka	Sharangadhara Samhita
Hema Garbha Pottali II	Sikta Yantra	Yoga Ratnakar
Hema Garbha Pottali IV	Bali Drava Paka	Yoga Ratnakar
Reto Rodhan Pottali	Dugdha Paka	Siddha Bheshaja M.M.

Procedure

Various method for the preparation of Pottali Rasa are described these are follows:

1. **Bhavana method–** In this method Bhavana is given to the ingredients by means of Khalva Yantra and made into Churna or pill form.
2. **Puta Paka method–** In this method first ingredients are given Bhavana by using mentioned liquid then Puta is given by doing Sharava Samputa using Musha, Pot, Mrigashringa, Varatika or Shankha etc. Bhudhara or Gaja Puta depending upon nature of ingredients is given.
3. **Gandhaka Drava Paka method–** It is done in following steps.
   - Bhavana to the ingredients is given and it is made into Shikhraakar/pugakara.
   - Then it is wrapped by silk cloth following by tagging with cotton thread.
   - Gandhaka is taken in an earthen pot/Enamel pot or Borosil Glass and prepared Pottali is hanged into it. Temperature is provide to melt the Gandhaka (120^0C-150^0C). Dola Yantra is also used for this purpose.
   - Paka is performed till the colour of Gandhaka turns to Vyoma Varna (Sky colour)
   - After that heating is stopped and cloth is removed after completed cooling. It should have metallic sound which is characteristic of Pottali.

Necessary Equipment- Sharava Samputa, Musha, silk cloth earthen pot/Enamel pot or Borosil Glass

Shelf life- may be as of Rasaaushadhi

Tamragarbha Pottali

Ingredients-

1. Mayurkantha Tamra Bhasma- 10 Karsha
2. Kajjali- 1 Karsha
3. Shuddha Gandhaka Churna- 1 Tanka
4. Shuddha Swarna- 6 Gunja

Pottali is prepared by Pottali Nirmana Vidhi.

Dose- 1/2 – 1 Ratti

Therapeutic Uses- It is effective Pottali Kalpa in symptoms of Pranavaha Srotas like Kaphajanya Tridoshaja Kasa and Jwara etc.

Lohagrarbha Pottali

Ingredients-

1. Loha Bhasma- 10 Karsha
2. Kajjali- 1 Karsha
3. Shuddha Gandhaka Churna- 1 Tanka
4. Shuddha Swarna- 6 Gunja

Pottali is prepared by Pottali Nirmana Vidhi.

Dose- 1/2 – 3 Ratti

Therapeutic Uses- Samgrahani, Pandu, Kamala etc

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13 CHAPT. Current and Emerging Trend in Ayurvedic Pharmaceuticals Cosmetics

Syllabus

Cosmetics-Formulation, Regulatory Provisions- Brief Introduction to Cosmetics-Formulation, Regulatory Provisions, Plant Layout and other factory requirements, process used in the manufacture of Cosmetics, Most commonly used cosmetic Raw materials, Control of microbial contamination in the manufacture of cosmetics and Quality Control of cosmetics, Skin Sensitization Sensitivity Testing, In vitro-Tests for Skin Irritation, Quality Control of Raw materials, Intermediates and Finished Products, Stability of Cosmetics.

Introduction to Dosage Forms- Introduction, Classification of Dosage forms (Solid dosage forms, Liquid dosage forms and Semisolid dosage forms), Need of dosage forms.

Learning objective

1. Discuss the classification of different dosage forms.
2. Explain the need of different dosage forms.
3. Enlist categorical information about the cosmetics used in dailyroutine. Appreciate Ayurvedic cosmetic products.
4. Appreciate Ayurvedic cosmetic products.
5. Choose and record the contemporary machineries used in themanufacture of cosmetics.
6. Enlist Quality Control parameters of cosmetics preparations.

Total - 07 hours (Lecture :03 hour, Non-lecture: 04 hours)
Marks - 05 marks, LAQ (10 Marks)- No, SAQ (5 Marks)- Yes, MCQ- No

Introduction

Generally the cosmetics are external preparations that are applied to external parts of the body for various purposes like colouring, softening, cleansing, nourishing, selting, waving, removal modification, protection and preservation to skin, hair and nails. Cosmetics is defined in the Drugs & Cosmetics Act 1940, Section 3 [(aaa)] as follows:

''Cosmetics'' means any article intended to be rubbed, poured, sprinkled or sprayed on, or introduced into, or otherwise applied to, the human body or any part thereof for cleansing, beautifying, promoting attractiveness, or altering the appearance, and includes any articles intended for use as a component of cosmetics. 'Words but does not include soap' omitted by Act 68 of 1982, S. 3 (w.e.f. 1-2-1983).

The cosmetics may be of four groups as follows:

1. For Skin
2. For Hair
3. For Nail
4. For Hygiene

These are formulated as solid, semi solid or liquids, various types of cosmetics are–

1. Skin–

a) **Powder compacts–** Face powder, Body powder, Prickly heat powder, Face Pack.
b) **Lotions–** Skin lotions, Astringent lotions
c) **Creams–** Cold cream, Vanishing cream, all-purpose creams.
d) **Colourants–** Lipsticks, Ranges, Lip Balm

2. **Hair–**

a) Shampoos, Dyes, Hair lotions, Dandruff lotions.

b) Hair remover, Depilatories, Shaving creams, Epilatories.

c) Hair wave preparation, Hair conditions, Hair dressing.

d) Eye lash preparations, Mascaras, Kohis, Eye brow pencil.

3. **Nail–** Lacquers, Laquer removes, Nail polishes

4. **Hygienic–**

a) **Bath–** Soap, Bath Salts,

b) **Dental–** Powder, Mouth Washes, Lotions, Cream

Shampoo

1. Moisture

Moisturizers are one of the most widely used cosmetics preparation that are used for the softening of the skin. Humectants, occlusive, emollients along with vitamins, antioxidants are used in the preparation of these type of cosmetics. Fragrances and colouring agents are used more for their aesthetic value than for their moistening properties. Moisturizer can be of oil in water (o/w) or water in oil (w/o) type. The emulsifier and oil-soluble components are combined in a beaker and melted at 75^{0}C in a water bath. Water, water soluble materials and preservative are melted at 750C in another beaker. Oil phase is placed in a mortar and pestle after heating and the water phase in gradually added and triturated until a clicking sound is heard. In w/o water is placed in mortar and pestle and oil soluble components are added gradually and triturated.

Methyl Para hydroxy benzoate-Q.S.

Propyl Para hydroxy benzoate-Q.S.

Mix together the ingredients of 'A' and heat at about 70^{0}C. In a separate vessel dissolve the preservatives in the glycerine with the aid of little heat. Add the remaining ingredients of 'B' and heat it to about 70^{0}C. Add mixture of 'B' to 'A' slowly with continuous stirring. Stir until cool, adding the perfume at about 30^{0}C.

2. Sunscreen lotion

Lotions are generally meant for application to the skin and are directly applied on the needed part of body.

Formula of Sunscreen lotion is as follows–

1. A. Isopropyl myristate-2.0 gm
   Antiviray-10.0 gm
   Toilet spirit- 88.0 gm
   Perfume-Q.S.
   Colour (alcohol-soluble)-Q.S.
   Dissolve antiviray in isopropyl myristate. Dissolve perfume and colour in spirit. Mix both.

2. A. Filtrosol A 1000-5.0 gm
   Mineral oil-10.0 gm
   Stearic acid-2.0 gm
   Paraffin wax-1.0 gm
   Beeswax-2.0 gm
   Petroleum jelly-5.0 gm
   Silicone fluid-8.0 gm
   Polyethylene glycol monostearate-5.0 gm
   B. Triethanolamine-2.0 gm
   Water-60.0 gm
   Perfume-Q.S.
   Preservative-Q.S.

Heat ingredients of 'A' to a temperature of about 700C. Heat ingredients of 'B' to same temperature and add slowly to the mixture of 'A'. Stir until cool. Add perfume when the temperature comes down to about 350C.

Aqueous solution type

Formula 9

Filtrosol B-7.0 gm

Methyl cellulose-0.5 gm

3. Shampoo

Shampoo are used for the purpose of cleansing of hair. Along with cleansing these may provide nourishment, glooming property, conditioning etc. Surfactants are the main component of shampoos. Along with-it antidandruff agents, conditioning

agent, pearlescent agents, thickening agents, perfumes, preservatives, colours are also used.

Liquid cream shampoos

Ingredients– Monoethanolamine lauryl sulphate (27% active)–40.0 gm

Ethylene glycol monostearate –5. Gm
Water –55.0 gm
Perfume–Q.S.
Preservative–Q.S.

Method of preparation– Heat and mix the ethylene glycol monostearate with a small quantity of the detergent to form a homogenous mixture. Add more detergent slowly and then water mixing thoroughly before addition of next. Perfume is added last after cooling to 35^0C.

4. Soap

Soaps may be locked upon as esters of higher fatty acids or of rosin acids with metallic salts such as Na, K, Ca, Ba, Mg, etc. or with other alkaline materials such as ammonia or organic alkalies. They are formed either by reacting the naturally occurring triglycerides of higher fatty acids (vegetables or animal oils) with alkalies or by reactions between pure fatty acids and alkaline materials. The fatty acids must have a carbon chain of 12 to 18 carbon atoms without which the non-polar part becomes weak. Three important groups of soaps are alkali soaps, metallic soaps and amine soaps.

Na and K soaps are representatives of alkali groups. They are usually highly alkaline with a pH of about 10 and are very sensitive to hard waters containing bivalent ions such as Ca, Mg, etc.

5.Perfume

Perfumes are liquid mixtures that are used to emit a pleasant odour. These can be formed from fragrant essential oils derived from plants and spices or synthetic aromatic compounds. The ingredients of the perfumes may include primary scents, modifiers, blenders and fixatives. Method for the preparation of perfumes include extraction, blending, aging and quailing control.

6.Face pack

Face pack are semi solid cosmetics that are spread over face after that it is allow to dry for a short time and then it is removed. These can be used for the fairness as well as smoothness of skin. Face pack may include turmeric, yogurt, Kaolin, skin soothing agent, thickening agents etc.

7. Talcum powder

Power are solid dry dosage form in the form of finely divided particle that can be used externally or internally. Talcom powder are body powder that are used externally on the body for a various purposes. The preparation includes dry mixing of finely powdered materials. Ingredients of Talcom powder is as follows–

1.	Talc	– 39.7 gm
2.	Kaolin	– 39.5 gm
3.	Calcium carbonate (Light)	– 5.0 gm
4.	Zinc oxide	– 7.0 gm
5.	Zinc sterate	– 7.0 gm
6.	Magnesium carbonate	– 1.2 gm
7.	Colour	– 0.2 gm
8.	Perfumes	– 0.6 gm

8.Lip Balm

Lip Balms are the preparations that are applied to lips for its smoothening and protection from being cracked. Lip balm may contain beeswax, camphor, cetyl alcohol, lanolin, paraffin and petroleum. Along with these colourants and fragrant may also be used. For the preparation of lip balm bee wax is melted over water after that other ingredients are added and allowed to cool.

9.Lip stick

Lipsticks are basically dispersions of colouring matter in a base consisting of a suitable blends of oils, fats, and waxes suitably perfumed and flavoured, moulded in the form of a stick and enclosed in a case.

Composition

The stick mainly contains a colour material dispersed and suspended in a suitable base made by blending oils and waxes in various proportions to yield the desired melting point and viscosity. The

temperature of human body varies between 36^{0}C to 38^{0}C with lips having the higher side. The base of the lipstick must have a melting point appreciably higher than this, between 55^{0}C to 75^{0}C preferably about 62^{0}C, for the product to withstand exposure to hot climates.

The basic raw materials required for formulating lipsticks can be classified as–

1. Wax mixture
2. Oil mixture
3. Bromo mixture
4. Colours
5. Preservatives, fragrances, surfactants and other additives

10.Tooth paste

Toote paste is the most popular product used in cleaning and caring for teeth in the modern era. The toothpaste should be such that it can clean the teeth without causing any harm. There is no effect of external temp. on tooth paste so that remains the same consistency in different seasons like, summer, winter etc. after taking it out from the tube, it can be easily placed on the brush so that it can used on the teeth. Different ingredients are used in the manufacturing the toothpaste. These constituents substance are as follow.

1. Abrasives-
2. Detergents
3. Binding agents
4. Sweetening agents
5. Humectants
6. Flavouring agents
7. Preservatives

1. **Abrasives-** Abrasives are the substances that are used for abrading, grinding or polishing. They remove substances adhering to the surface of the teeth without scratching it and bring out their natural luster. One of the mayor properties of the abrasive is hardness. The degree of abrasivity depends on the hardness of the abrasive, the morphology of the particles, and on the concentration of abrasive in the paste. As the hardness of the enamel on the tooth surface is 6-7 on the Moh's scale, the hardness of an abrasive should be 3 or less. For practical purposes, the particle size should be 20Ïm or less; if it is more than this they may damage the tooth surface and gums. Calcium carbonate ($CaCO_3$)- A fine, white, odourless, microcrystalline powder, practically insoluble in water. This abrasive has been used for a very long time.
2. **Detergents-** The functions of foaming agents are to disperse the toothpaste throughout the oral cavity in order to enhance the cleaning effect and, acting as a *surfactant*, clean away the dirt inside it. Also, by means of their volume of foam, they give a feeling of thickness, and satisfaction. Surfactants having excellent foaming, dispersion, suspension, permeation, cleansing and hard water resistance qualities as well as no toxicity or irritation, are selected for foaming agents.

   Sodium lauryl sulphate (SLS)- A mixture of sodium alkyl sulphates, consisting mainly of sodium dodecyl sulphate. It is a white or pale yellow powder or crystals with a slight characteristic odour. Freely soluble in water; partly soluble in alcohol. It exhibits high affinity for proteins and is a strong denaturing agent. Incompatible with cationic materials and with acids below pH 2.5. Sodium lauryl sulphate may be irritant to the skin and mucosa.
3. **Binding agents-** Binders are used to prevent the separation of powder and liquid ingredients and give an appropriate degree of viscoelasticity and form to the toothpaste. They can prevent the toothpaste from drying out by binding water. Also, they have an influence on the dispersion, foaming, rinsing and other qualities of the toothpaste in the oral cavity. The most widely used binder at present is sodium carboxym-ethylcellulose (CMC).

   Sodium alginate- It is obtained from algae belonging to the Phaeophyceae, mainly species of Laminaria. It consists chiefly of the sodium salt of alginic acid. A white or pale

yellowish-white powder which is odourless or almost odourless and tasteless.

Colouring agents - Most toothpastes and mouthwashes contain colour-substances which give them an attractive appearance. The colour-substances are classified by the Colour Index (CI), published by the Society of Dyers and Colourists and the American Association of Textile Chemists and Colourists, or by a system called the FD&C Colours. Titanium dioxide is often added to toothpastes to give them a white colour.

4. **Sweetening agents**- Sweeteners also improve the taste of toothpastes and mouthwashes and give them a mild and sweet taste. The most common used sweeteners are sodium saccharin, sorbitol and glycerol. Xylitol is a sweetener that is also claimed to provide anti-caries activity.
5. **Humectants**- They prevent loss of water, and subsequent hardening of the paste in the tube or when it is exposed to air. They also provide creamy texture. These are short-chained polyalcohols such as glycerol, sorbitol (highly concentrated aqueous solution), propylene glycol and polyethylene glycol.
6. **Flavouring agents**- They get rid of the unpleasant smell and taste of the other raw materials and give a cold, refreshing taste. Combinations of water-insoluble essential oils, such as spearmint, peppermint, eucalyptus and menthol are often used as flavouring agents in toothpastes and mouthwashes. The flavouring agents are solubilised and dispersed through the paste or liquid via the surfactant.
7. **Preservatives**- Preservatives prevent the growth of micro-organisms in toothpastes and mouthwashes. Mostly, they include sodium benzoate, methylparaben and ethylparaben.

Tooth Powder

Dentifrices are the products which are used to maintain the oral hygiene such as freshness of mouth and to avoid tooth decay.

Types of tooth powder

1. **Whitening Tooth Powder**- The purpose is to freshen breath, help gums and reduce the amount of inflammation in the mouth. It is used to polish and whiten a person's teeth.
2. **Natural Tooth Powder**- Ingredient like sea salt which act as an abrasive, natural chalk and certain essential oils like peppermint, eucalyptus used in the natural tooth powder.
3. **Herbal Tooth Powder**- Sore or bleeding gums also can benefit from herbal tooth powder. Can have a variety of ingredients. Baking soda, powdered chalk, and white clay are common. Herbal tooth powder has been around for centuries and many believe it to be as essential part of any Teeth Cleaning regimen.
4. **Homemade Tooth Powder**- These powders also can be made at home. Homemade herbal tooth powder can be beneficial because they may cost less and the person making it will know what ingredients he is putting in his mouth or in the mouth of the children.

Tooth powder is a mildly powder that is used in combination with tooth brush to maintain oral hygiene. The manufacturing of tooth powder is a comparatively simple operation. The primary objective is the homogenous distribution of all the ingredients without contamination of foreign substances.

A. Simple powder- Contains only one constituent eg. Hyoscine hydrobromide (Motion sickness)
B. Compound power. Contains more than one constituent eg. Oral Rehydration Salt (Diarrhea).
C. Effervescent powder: Usually a compound powder which when mixed with water would give rise to effervescence due to liberation of carbon dioxide eg- Seidlitz powder contains tartaric acid and sodium bicarbonate (for constipation), Eno fruit salt powder.

11. Mouth wash

Mouthwash, mouth rinse, oral rinse, or mouth

bath is a liquid which is held in the mouth passively or swirled around the mouth by contraction of the perioral muscles and/or movement of the head, and may be gargled, where the head is tilted back and the liquid bubbled at the back of the mouth.

Usually mouthwashes are antiseptic solutions intended to reduce the microbial load in the mouth, although other mouthwashes might be given for other reasons such as for their analgesic, anti-inflammatory or anti-fungal action. Additionally, some rinses act as saliva substitutes to neutralize acid and keep the mouth moist in xerostomia (dry mouth). Cosmetic mouthrinses temporarily control or reduce bad breath and leave the mouth with a pleasant taste.

1. Antiseptic or antibacterial substances
2. Astringents
3. Deodorizing substances
4. Surfactants
5. Sweeteners
6. Colouring agents
7. Flavouring agents
8. Vehicle

12.Foot cream

Foot creams are solid dosage form that are specially meant for foot care. It protects foot from dryness, cracking etc. These can be prepared according to cream preparation method.

13.Hand Sanitizer

These are the preparations which are used for the cleaning of hand especially for killing of pathogens present on our hands. According to WHO the hand sanitizer contain the following ingredients.

1. Ethanol - 80% vol/vol
2. Glycerol - 1.45% vol/vol
3. Hydrogen peroxide - 0.125% vol/vol

However, sanitizer may contains alcohol, emollient, gelling agent and sterile distilled or cooled boiled water. These can be made by mixing process. (Taken from– A hand book of cosmetics B M mithal & R N Saha.)

The main ingredients mostly present in the cosmetics are water, emulsifiers, thickeners, moisturizer, colourant, flavouring agent and preservatives.

Regulatory provision- Cosmetics is defined in section 3 [(aaa)] in chapter I of Drugs and Cosmetics Act, 1940.

The chapter II, deals with The Drug Technical Advisory Boards. The Central Drugs Laboratory and the Drugs Cosmultative committee The chapter III deals with Import of Drugs (And Cosmetics). In this chapter, standard of quality, misbranded cosmetics, Spurious cosmetics, prohibition of import of certain drugs or cosmetics, power of Central Government to prohibit import of drugs and cosmetics in public interest. Application of law relating so sea customs and powers of customs officers, power of Central Government to make rules, offences, confiscation and jurisdiction.

The chapter IV deals with manufacture and Distribution of Cosmetics under which standard of quality, misbranded, spurious and adulterated cosmetics, prohibition of manufacture and sale of certain drugs and cosmetics, maintenance of records and furnishing of information, pleas, Government Analysit, Inspectiors, powers of inspectors, procedures of inspectors, person bound to disclose place where cosmetics are manufactured or kept, Reports of Analysts, purchaser of cosmetics enabled to obtain test or analysis, power of central Government to (Regulate, restrict or prohibit) manufacture, etc. of cosmetics in public interest, penality, confiscation, cognizance of offences, power of central Government to make rules.

17.C Misbranded cosmetics

For the purpose of this chapter a cosmetic shall be deemed to be misbranded–

a) if it contains a colour which is not prescribed, or
b) if it is not labelled in the prescribed manner; or
c) if the label or container or anything accompanying the cosmetics bears any statement which is false or misleading in any particular.

17-D Spurious cosmetics

For the purpose of this chapter a cosmetic shall be deemed to be spurious–

a) if it is manufactured under a name which belong to another cosmetics; or
b) if it is an imitation of, or a substitute for, another cosmetics or resembles another cosmetics in a manner likely to deceive or bears upon it or upon its label or container the name of another cosmetics unless it is plainly and conspicuously marked so as to reveal its true character and its lack of identity with such other cosmetics; or
c) if the label of container bears the name of an individual or a company purporting to be the manufacturer of the cosmetics which individual or company is fictitious or does not exist; or
d) if it purports to be the product of a manufacturer of whom it is not truly a product.

17-E Adulterated cosmetics

For purposes of this chapter a cosmetics shall be deemed to be adulterated-

a) if it consists in whole or in part, of any filthy, putrid or decomposed substances.
b) if it has been prepared, packed, stored under insanitary conditions where by it may have been contaminated with film or whereby it may have been rendered injurious to health.
c) if its container is composed, in whole or in part, of any poisonous or deleterious substance which may render the content injurious to health.
d) if it bears or contains, for purpose of colouring only, a colour other than one which is prescribed.
e) if it contains any harmful or toxic substance which may render it injurious to health; or
f) if any substance has been mixed there with so as to reduce its quality or strength.

Penalty

Penalty for manufacture, sale etc. of cosmetics in contraventions of this chapter

Spurious under section 17 D–Imprisonment for a term which may extend

Adulterated under section 17 E- to three years Fine shall not be less than fifty thousand- or 3-times value of cosmetics whichever is more.

Other than clause – Imprisonment for a term which may extend to one year or fine which may extend to 20,000 rupees or with both.

Penalty in contravention of – Imprisonment a term which may extend to 3 section 26 years and shall also be liable to fine which may extend to 5000 rupees.

The Cosmetics Rules 2020

The Cosmetics Rules 2020 is described in chapters along with

Chapter I– is preliminary and in this Chapter (i) short tittle (2) application (3) definitions (Act licence, loan license, state licensing authority etc.) is given.

Chapter II– Authorities, officers and laboratory (From Rule 4 to Rule 11)

Licensing Authorities including central and state, delegation of power, controlling officer, Government Analyst, and its function, power, duties and functions of inspector and establishment and function of central cosmetics laboratory is described.

Chapter III– Import and registration (From Rule 12 to Rule 22) in this chapter Rules related with import of cosmetics, Grant of import registration certificate (RC) and its validity (A period of five years) is described. Fresh application in case of change in constitution, suspension and cancellation of Registration certificate, import of cosmetics already registered for import prohibition of import of certain cosmetic.

Documents to be supplied to the commissions of customs procedures for import of cosmetics import of cosmetic for personal use import through points of entry are described.

Chapter IV– Manufacture of cosmetics for sale or Distribution (From Rule 23 to Rule 31).

- Application for grant of licence or loan license to manufacture cosmetics for sale or for distribution.
- Manufacture at more than one premises.
- Form of license or loan license to manufacture cosmetics for sale or distribution.
- Condition of license or loan license for manufacture of cosmetics
- Grant or refusal of license
- Further application for license or loan license after rejection
- Appeal to the state Government
- Validity of license
- Inspection for verification of compliance

Chapter V Permission for Import or manufacture of New cosmetics. (Rule 32)

Chapter VI Labelling, Packing and Standards for sale or Distribution of cosmetics (Form rule 33 to rule 39).

33. Prohibition of sale or distribution
34. Manner of labelling
35. Prohibition against altering inscription on container, labels or wrappers of cosmetics.
36. Prohibition against false or misleading claims.
37. Labelling or hair dyes containing dyes, colours and pigments.
38. Special provisions relating to tooth paste containing fluoride.
39. Standard of cosmetics.

Chapter VII-Procedure of Sampling for test or Analysis, Seizure & Report (Rule 40 to Rule 54)

40. Testing of Cosmetics from a purchaser
41. Procedure for sampling
42. Forms of receipts for seized cosmetic, record register, documents any other material object.
43. Manner of certifying copies of seized documents
44. Form of initiation of purpose of taking samples
45. Procedure for dispatch of sample to Government Analysis.
46. Form of order not to dispose of stock
47. Prohibition of sale
48. Procedure on receipt of sample
49. Dispatch of samples for test or analysis by order of court.
50. Recording of condition of seeds
51. Report of result of test or analysis
52. Insurance of certificates
53. Confiscation of cosmetics, implements, machinery etc.
54. Procedure for disposal of confiscated cosmetics.

Chapter VIII Approval of Laboratory for carrying out Tests on cosmetics and their Raw materials (Rule 55 to Rule 63)

55. Application for Grant of approval for testing cosmetics
56. Approval for carrying out tests on cosmetics on behalf or Cicasees
57. Inspection before grant of approval
58. Procedure of approving authority
59. Further application after rejection
60. Validity of Licence
61. Inspection for verification of compliance
62. General conditions after approval
63. Withdrawal and suspension of approval

Chapter IX Miscellaneous (Rule 64 to Rule)

64. Exemption of cosmetics
65. Voluntary recall of cosmetics
66. Fees for examination of samples
67. Mode of payment of fee
68. Applicability in case of inconsistency
69. Debarment of applicant
70. Digitalisation of form
71. Amendment in the Drugs Rules 1945
72. Savings

Plant layout and other factory requirements

(A) Location and Surrounding

General requirements– The factory shall be located in a sanitary place and hygienic condition shall be maintained in the premises. It shall be proper ventilated and clean and shall not be used for residence or be interconnected with residential areas.

(B) Buildings- Building of factory shall be constructed so as to permit production under hygienic condition and not to permit entry of insects, rodert, flies etc. The wall and floor shall be free from cracks and open joints. These shall be smooth, washable, covered so that effective cleaning and disinfection can be done.

Building should be adequately lit and properly ventilated appropriate to the operations.

Testing laboratory should be preferably be physically separated from the production area.

Storage area should be of adequate space provided with suitable lightening arranged and equipped to allow dry clean and orderly placement of stored materials and product. The walls of the room in which manufacturing operation are carried out shall be up to a height of above six feet from the door.

In the plant there should be water supply of potable water, facility for disposal of waste health, clothing and sanitary requirements of the staff and medical service should be provided.

II Requirements of plant and equipment

The following equipment, area and other requirements are recommended for the manufacture of–

Category	Equipment's	Area
A. Powders	Powder mixer of suitable type with a dust collection. Perfume and colour blender shifter with sieve of suitable mesh size	15 square meter with adequate exhaust fans

Other requirements

1. Ball mill of suitable grinder
2. Trays and scoops (stainless steel)
3. Filling and sealing equipment provided with dust extractor
4. For compacts–
   (i) a separate mixer
   (ii) Compact pressing machine
5. Weighing and measuring devices.
   (i) Storage tanks.

An area of 15 square metres is recommended. The section is to be provided with adequate exhaust fans.

(B) Skin powder for infants

Equipment's:

a) A suitable mixer
b) Storage tanks
c) Filling machine-hand operated or power driven.
d) Weighing and measuring devices.

An area of 15 square metres is recommended. The section shall be provided with flame proof exhaust system.

2. Premises– The following are the special requirements related to Nail Polishes and Nail Lacquers:

(a) It shall be situated in an industrial area.
(b) It shall be separate from other cosmetic-manufacturing area by metal/brick partition up to ceiling.
(c) Floors, walls, ceilings and doors shall be fire proof.
(d) Smoking, cooking and dwelling shall not be permitted and no naked flame shall be brought in the premises.
(e) All electrical wiring and connections shall be concealed and main electric switch shall be outside the manufacturing area.
(f) All equipment, furniture and light fittings in the section shall be flame proof.
(g) Fire extinguisher like foam and dry powder

and sufficient number of buckets containing sand shall be provided.

(h) All doors of the section shall open outwards.

3. Storage– All explosive solvents and ingredients shall be stored in metal cupboards or in a separate enclosed area.

4. Manufacture–

a) Manufacture of lacquer shall not be undertaken unless the above conditions are complied with.

b) Workers shall be asked to wear shoes with rubber soles in the section.

5. Other requirements– No objection certificate from local Fire Brigade Authorities shall be furnished.

(C) Lipsticks and Lip-gloss–

Equipment:

a) Vertical mixer

b) Jacketted kettle–steam, gas or electrically heated

c) Mixing vessels (stainless steel)

d) Triple roller mill/Ball mill.

e) Moulds with refrigeration facility.

f) Weighing and measuring devices.

An area of 15 square meters is recommended

D) Depilatories

Equipment:

a) Mixing tanks

b) Mixer

c) Triple roller mill or homogeniser (where necessary)

d) Filling and sealing equipment's

e) Weighing and measuring devices

E) Moulds (where necessary)

An areas of 10 squares meters in recommended.

G) Preparations used for Eye

Such preparations shall be manufactured under strict hygienic conditions to ensure that these are safe for use.

1. Eyebrows, Eyelashes, Eyeliners–

Equipment's

(a) Mixing tanks

(b) A suitable mixer

(c) Homogeniser (where necessary)

(d) Filling and sealing equipment

(e) Weighing and measuring devices

An area of 10 square meters is recommended

2. Kajal and Surma–

Equipment's:

a) Base steriliser

b) Powder steriliser (dry heat oven)

c) Stainless steel tanks

d) A suitable Mixer

e) Stainless steel sieves

f) Filling and sealing arrangements

g) Weighing and measuring devices

h) Homogeniser (where necessary)

i) Pestle and Mortar (for Surma)

An area of 10 square meters with a separate area of 5 square meters for base sterilisation is recommended. Other requirements for 1 and 2.

a) False ceiling shall be provided wherever required.

b) Manufacturing area shall be made fly proof. An airlock or an air curtain shall be provided.

c) Base used for Kajal shall be sterilised by heating the base at 1500C for required time in a separate enclosed area.

d) The vegetable carbon black powder shall be sterilised in a drying oven at 1200C for required time.

e) All utensils used for manufacture shall be of stainless steel and shall be washed with detergent water, antiseptic liquid and again with distilled water.

f) Containers employed for 'Kajal' shall be cleaned properly with bactericidal solution and dried.

g) Workers shall put on clean overalls and use hand gloves wherever necessary.

H) Aerosol:

Equipments:

a) Air-compressor (wherever necessary)
b) Mixing tanks.
c) Suitable propellant filling and crimping equipments.
d) Liquid filling unit
e) Leak testing equipment
f) Fire extinguisher (wherever necessary)
g) Suitable filtration equipment
h) Weighing and measuring devices.

An area of 15 square meters is recommended

Other requirements–No objection certificate from the Local Fire Brigade Authorities shall be furnished.

(I) Alcoholic Fragrance solutions

Equipments :

a) Mixing tanks with stirrer
b) Filtering equipment
c) Filling and sealing equipments
d) Weighing and measuring devices. An area of 15 square meters is recommended.

J) Hair Dyes–

Equipments :

a) Stainless steel tanks
b) Mixer
c) Filling unit
d) Weighing and measuring devices
e) Masks, gloves and goggles

An area of 15 square meters with proper exhaust is recommended.

(K) Tooth-powder and toothpastes, etc.–

1. Tooth-powder in General.

Equipments :

a) Weighing and measuring devices
b) Dry mixer (powder blender)
c) Stainless steel sieves
d) Powder filling and sealing equipments.

An area of 15 square meters with proper exhaust is recommended

2. Tooth pastes

Equipments :

a) Weighing and measuring devices.
b) Kettle–steam, gas or electrically heated (where necessary)
c) Planetary mixer with de-aerator system.
d) Stainless steel tanks.
e) Tube filling equipment
f) Crimping machine.

An additional area of 15 square meters with proper exhaust is recommended.

3. Tooth–Powder (Black)

Equipments :

a) Weighing and measuring devices
b) Dry mixer powder blender.
c) Stainless steel sieves
d) Powder filling arrangements

An area of 15 square meters with proper exhaust is recommended. Areas for manufacturing ''Black'' and ''White'' tooth-powders should be separate.

(L) Toilet Soaps

Equipments :

a) Kettles or pans for saponification
b) Boiler or any other suitable heating arrangement
c) Suitable stirring arrangement
d) Storage tanks or trays.
e) Driers.
f) Amalgamator or chipping machine
g) Mixer
h) Triple roller mill
i) Granulator
j) Plodder
k) Cutter

l) Pressing stamping and embossing machine

m Weighing and measuring devices.

A minimum area of 100 square meters is recommended for the small-scale manufacture of toilet soaps.

The areas recommended above are for basic manufacturing of different categories of cosmetics. In addition to that separate adequate space for storage of raw materials, finished products, packing materials shall be provided in factory premises.

Most commonly used cosmetic Raw materials

1. Absorbents– e.g. Potato starch, Calcium carbonate, Magnesium carbonate etc.
2. Adhesives– Calcium myristate, Magnesium myristate, Calcium stearate etc.
3. Antioxidants– Ascorbic acid, Gallic acid, Citric acid, Lecithin etc.
4. Antiseptic– Bethional, Boric acid, Campher, Methonal, Phonet etc.
5. Binders– Carboxy methyl cellulos, Starch, Fragacanth, Mineal oil etc.
6. Colours– Alizarin, Carmine, Saffron etc. and other permitted in Cosmetic rule 2022.
7. Detergents– Acyl peptids, Acyl sarcocine Isopropanal amide etc.
8. Emollients– Coca butter, Ground nut oil, Isopropyl myristate etc.
9. Film formers-Acacia, Agar, agar, Beeswas, Stearic acid etc.
10. Hair colorants– Bismith citrate, Henna etc.
11. Hair removers– Arsenic trisulphide, Zinc sulphide etc.
12. Hair conditioning agent-Amino acids, eggs etc.
13. Humectants–Fructose, Glucose, Mannitol etc.
14. Oils– Arachis oil, Castor oil, Mustard seed oil etc.
15. Perfumes– Ambugris, Eugenol, Civet etc.
16. Preservatives – Benzoic acid, Salicyelic acid etc.
17. Waxes– White bee wax, Cocoa butter, Paraffin wax etc.

Hair colourants, Opacifiers, Pearlscent agents, Plaasticisers, Skin nourshing agents, Solvent/ vehicles, Sun screen agent staining agent, Suspending agent are also used in preparetion of cosmetics.

Process used in the manufacture of Cosmetics– Mixing is the process that is used in the manufacture of cosmetics. The other processes that are used for manufacture may include dissolution, heating and stirring , Homogenic zation, cooling, adjustment of pH, filtration and storage (Science direct. com).

Control of microbial contamination in manufacture of cosmetics–Cosmetics require very hygienic conditions during the manufacturing because these contain water and organic/inorganic compound that makes it most suspteble for growth of pathogenic organisms. Microbial contamination may occur during the manufacturing or during the use. The causes of microbial contamination during the manufacture may be as follows–

1. Contamination of Raw material
2. Contamination during manufacture and packaging
3. Poor product preservation

All these causes lead to risk of product deterioration. Most frequently micro organisms Pseudomonas aeruginosa, Klebsiella, oxytoca, Staphylococcus aureus etc. are found in the cosmetics.

Control– Good manufacturing practices, must be strictly followed during the manufacturing of cosmetics. Water treatment, microbial control of raw materials, equipment's disinfection, qualification of personal, use of preservative and antioxidant can reduce the risk of contamination.

[Hall N, Fernandes IP, Heleno SA, Costa P, Boucherit-Otmaniz, Boucherit K, Rodrigues AE, Ferreica ICFR, Borreiro MF. Cosmetics Preservation : A Review on present strategies. Molecules. 2018 June 28; 23(7):1571].

Quality control of cosmetics

Quality control is a corparison with a standard

whether a cosmetic product adheres to a certain criterion. Standard consist of–

1. Formula
2. Operating standards
3. Raw material specification
4. Packaging material standards
5. Finished product standard
6. Testing method

Skin Sensitization Sensitivity Testing

Skin sensitisation (Allergic contact dermatitis) is an immunologically mediated cutaneous reaction to a substance. In human the responses may be characterised by pruritus, erythema, oedema, papules, vesicles, bullae or a combination of these. In other species the reaction may differ and only erythema and oedema may be seen. (OECD Guidelines) Skin sensitization testing identifies the potential for a substance to cause allergic contact dermatitis (ACD). Skin sensitization testing is performed as follows.

1. Animal tests–The guinea pig maximization test
   The Buchelar test
   The Murine local lymph node assay (LLNA)
2. Human tests–Human repeat insult patch test
   Human maximization test

Skin sensitization can be broadly divided into sensitization and elicitation phase. In the sensitization phase, the chemical agent reacts with skin proteins leading to expansion of antigen-specific T-Cell clones. Due to subsequent exposure of some sensitizer a specific T-cell mediated immune response can be elicted which is known as elicitation phase. Guinea maximization test and Buchelor test evaluate the elicitation phase and LLNA evaluate the sensitization phase at the draining lymph nodes.

However, due to ethical concern about animal testing, legal restriction on the use of animal data and scientific concern about the relevance of animal test results to human outcomes alternative approach are increasing.

General principle of sensitization tests in Guinea Pigs– The test animals are initially exposed to the test chemical by intradermal injection and/or epidermal application (induction exposure) following a rest period of 10 to 14 days (induction periods) during which an immune response may develop, the animals are exposed to a challenge dose. The extent and degrees of sking reaction to the challenge exposure in the test animals is compared with that demonstrated by control animals which undergo same treatment during induction and receive the challage exposure. (OECD Guidelines).

In Vitro-Tests for Skin Irritation

Acute skin irritation is a local reversible inflammatory response or damage to skin that occurs after exposure to a substance or mixture. OECD test guideline addresses the human health end point skin irritation. It is based on the in vitro test system of reconstructed human epidermis (RhE), which closely mimics the bio-chemical and physiological properties of the upper parts of the human skin i.e. the epidermis.

The test chemicals applied topically to a three-dimensional RhE model. Chemical-induced skin irritation, manifested mainly by erythema and oedema. The RhE-based test methods in the absence if any vascularisation in the vitro test system, measure the initiating events in the cascade, e.g. cell/tissue damage using cell viability as read out. Cell viability in the RhE model is measured by enzymatic conversion of the vital dye MTT into a blue formazan salt that is quantitatively measured after extraction from tissue.

Depending on the RhE test methods used, the exposure period ranges between 15 and 60 minutes, and the incubation temperature between 20-370C. Viability measurement is performed after 42 hours post treatment incubation period. HPLC/UPLC spectrophotometry may be used also with all types of test chemicals (Coloured, non coloured, MTT reducers and non-MTT reduces) for measurement of MTT formazan. The OD values obtained with each test chemical can be used to calculate the %

of viability normalized the negative control which is set to 100%. In case HDLC/UPLC spectrophotometry is used the % tissue viability is calculated as percent MTT formazan peak area obtained with the living tissues exposed to the test chemical relative to the MTT formazan peak obtained with the concurrent negative control. (Based on OECD Guidelines).

MTT– C3- (4, 5-dimethyl thiazol-2-yl)-2, 5-diphenyl

HPLC– High performance liquid chromatography

UPLC– Ultra performance liquid

Quality control of Raw materials

A large variety of raw materials are used in the manufacturing of cosmetics Bureaue of Indian standards has fix specification for many raw materials. The raw materials which do not have IS standards are generally analysed as per I.P., B.P., U.S.P or CTFA specification. Tests for raw materials involve the following parameters.

i) **Physical**– Colour, odour, viscosity, refractive index etc.

ii) **Chemical**– Active ingredients, impurities etc. Limit of impurities in cosmetics is specified in Drug and Cosmetic Act.

Quality control of finished product

Finished product quality control is done on physical and chemical parameter physical tests involve, colour, density, viscosity, melting and boiling point, hardness and softness, foam tests etc. Chemical test are carried out to find out activity, alkalinity and assay of particular active ingredients etc. Besides these cosmetics do not have any type of microbial contamination.

Stability of cosmetics

The purpose of stability testing of cosmetic product is necessary to ensure that its physical, chemical and microbiological quality standards are appropriate when stored under specified condition. Because of wide variety of cosmetic product and their inherent complexing standard stability tests cannot be prescribed.

General stability of a cosmetic product

Weather conducted in real time or under accelerated conditions test should be done in order to assure–

a) Physical stability
b) Chemical stability
c) Microbiological stability
d) The compatibility between the contents and the contain.

Assessment of cosmetics can be done on following parameters however it should be determined according to category of cosmetics.

i) Colour, odour, appearance
ii) pH
iii) Viscosity
iv) Presence of specific active ingredients in the product
v) Microbial tests demonstrating the abiling of produces to prohibit microbial growth during normal use. Real time monitoring are done to gain additional assurance that the accelerated testing in truly predictive of market stability. Such monitoring should be carried out on the actual production product in the find package.

Introduction to Dosage form

Introduction– Drugs are rarely administered in their pure form. Before administration or into its final appearance drugs are mixed with different types of adjuncts, resulting into their transformation which is called as dosage form the different dosage forms are also needed according to chemical entity of drug or the action which is desired at particular route. The dosage form if a drug should be designed in such a manner of that it can fulfil the expectation of the physician, pharmaceutical scientists and patients who are intimately associated with creation, prescription and consumption of the dosage forms.

Classification of Dosage forms

Dosage forms can be of 3 types :

1. Solid dosage forms

2. Liquid dosage forms
3. Semisolid dosage forms

1. Solid dosage forms

These are of following types.

(a) **Tablet–** Oral, lozenge, Buccal, Sublingual, Chewable, Soluble, Hypodermic
(b) Pills- Soft–oral, Suppositories ointments
(c) Capsules
Hard
Dry seal
(d) Cachets
Wet seal
Internal use
(e) Powders

External use– Ear powder, Snuffs powder, Dusting powder tooth powder, Ophthalmic powder.

2. Liquid dosage forms

Internal– Drops, Elixers
(i) Monophasic
External–Lotions, liniments, Gargles, Mouth washes eye drops, Ear drops, Ear drops, Nose drops, inhalations
Emulsion–Oral, External, Parentral, Ophthalmic
(ii) Biphasic
Suspensions– Oral, External, Parentral, Ophthalmic
(c) Semisolid dosage forms
(a) For external use
(i) Ointments– Oleaginous, water washable, Absorption, Emulsion (Creams)
(ii) Plasters
(iii) Suppositories– Rectal, Vaginal, Urethral, Nasal, Ear cones, Eye disease
(b) For internal use– Electuaries

1. **Granules :** Granules are the solid dosage form that are intake through oral routes either alone or with any vehicle like water or milk etc. Granules can be made wither by breaking big pieces of drug into small pieces i.e. in granules form or can be made from powder by adding any suitable binding agent. Granules are used for the breaking of big size drug into granules. For the preparation of granules from the powder these are mixed with binding agent then granules are made by pressing it over suitable size of sieve.
2. Lozenges : These are solid dosage forms that are intended to be dissolved slowly in the mouth. These may consists of one or more active ingredients along with colouring, flavouring and sweetening agent.
3. Syrup is viscous, concentrated solution of sucrose and other sugars. They are either flavouring syrups or medicated syrups. Generally, syrups are aqueous solution of sucrose or dextrose but these can be prepared by using artificial sweetening agents and viscosity builders. When syrup contains some medicament then it is known as medicated syrup. If it contains flavouring agents but not medicament then its is known as flavouring syrup. Besides using sucrose and other sweetening agent sorbitol is used to prepare syrup now-a-day. Sorbitol syrup is considered better to simple syrup. It does not produce any irritation in mouth and throat. A simple syrup is that which contains only sucrose and purified water.

Components of syrup

Most syrups contain sugar, preservatives, colorants, flavourants with or without medicaments. Syrups can be prepared by:

1. Solution of the ingredients with the aid of heat.
2. Solution of the ingredients by agitation and without use of heat.
3. By addition of sucrose to already prepared medicated liquid/ flavoured liquid
4. by percolation method. The preservative like sodium benzoate, benzoic acid, methyl paraben etc. can be used. Now-a days a combination of two or more preservatives is

used because such combination give a broader spectrum of antimicrobial qualities.

Elixirs

Elixirs are defined as clear, sweetened, flavoured hydro-alcoholic solutions intended for oral use and are generally flavoured to enhance their palatability. But now a days several elixirs do not contain sugar or any other sweetening agent and many other may not contain alcohol. Elixirs are relatively more stable and can be easily prepared.

4. Suspension

Definition : It is generally consisting of a finely divided solid (Ranging in size from 0.5 to 5.0 m) suspended in a liquid or semi solid vehicle which constitutes the continuous phase. Following additives generally feature in suspension systems:

(a) Flocculating agents

(b) Suspending agents

(c) Wetting agents

(d) Dispersants

(e) Preservatives and organoleptic additives

(a) Flocculating agents– The flocculating agents may be electrolytes, polymers or surfactants. Electrolytes are employed when a product having a large sedimentation volume is envisaged.

Various hydrocolloids (used as polymer) which not only assist in flocculation but are helpful in increasing the viscosity of continuous phase as well.

Ionic as well as non-ionic surfactants may also bring about flocculation of particles. Ionic surfactants may act by neutralizing the surface charges while non-ionic surfactants may be get adsorbed and help in formation of bridge.

(b) Suspending agents– The agent which increase the viscosity of the continuous phase are known as suspending agents. For aqueous systems various hydro colloids are used while waxs are suitable for oily suspensions.

(c) Wetting agents– The surfactants, are employed as wetting agents.

(d) Dispersants– Some materials where the quantum of surface charge is not sufficient the particles may exhibit tendency of coming together and forming larger particles. To overcome this tendency some materials, which carry good charge and can get easily adsorbed on to the disperse phase particles can be added organic salts of alkaryl type fall in this category.

(e) Preservatives and organoleptic additives– Normally a combination of two or more esters of the r-hydroxy benzoic acids is used.

For oral suspensions sweetening and flavouring agents may have to be used. Suspensions for topical application are generally perfumed.

5. Emulsion

Before description of emulsion, it is necessary to describe the colloid. A colloid is a homogenous nanocrystalline substance consisting of large molecules or ultra microscopic particles of one substance dispersed through a second substance or dispersing medium. Colloids includes gel, sols and emulsions. The particles of this system do not settle and cannot be separated out by ordinary filtering or centrifuging like those of suspension.

Colloids can be classified as follows–

		Dispersed Phase		
		Solid	Liquid	Gas
Dispersion Medium	Solid	Colloidal Gold in glass	Gel	Solid Foam
	Liquid	Colloidal Gold in water	Emulsion	Foam
	Gas	Smoke	Aerosol	–

Definition of Emulsion

An emulsion is a type of colloid in which both medium i.e. dispersion medium and dispersed phase is liquid and both the liquids are immiscible with each other. There are two basic types of emulsions–

1. Water-in-oil (w/o)
2. Oil-in-water (o/w)

Besides this multiple emulsion (o/w/o or w/o/w) and micro emulsions are also types of emulsions.

Emulsifying agent

These are the substances that are soluble in both water and fat and enable fat to be uniformly dispersed in water as an emulsion. Here are some agents which used as emulsifying agent–

1. Gums–e.g. Acacia, tragacanth
2. Carbohydrates–e.g. Starch
3. Aluminium hydroxide
4. Soap etc. are used as emulsifying agent

Emulsion Components

It includes the following three:

1. Emulsifier such as gum, starch etc.
2. Vehicle–It contains oil phase and aqueous phase
3. Additives–It includes preservative, antioxidants, humectants, flavouring agents, sweetening agents

Preparation of Emulsions

Various types of machines are used for the preparation of emulsion. These are as follows–

1. **Mixers**–These involves agitating of ingredients with the help of beaters. It should be designed (beaters and containing vessel) so that continuous movement is provided in all parts of the liquid.
2. **Colloid Mills**–Then machine are suitable for preparing emulsion.
3. **Homogenisers**–These machines break large globules in a coarse emulsion and then into smaller globules.
4. **Ultrasonic Emulsifier**–In this ultrasonic vibration are produced due to which alternate region of compression and rarefaction are produced. Cavities are formed in the region of rarefaction and later these collapse with great force which produce emulsification.

Pharmaceutical Application of Emulsion

1. It covers the unpleasant taste.
2. Topical emulsions are washable.
3. It increases the absorption rate.
4. It is less greasy.
5. Emulsions are having acceptable viscosity.
6. It increases bioavailability.
7. Emulsions of both types are used extensively in the preparation for external and in cosmetic preparations O/W type of emulsions are used as a dosage form for the intravenous administration of oils and fats.

6. Liniment

Liniments may be liquids are semisolids that are rubbed on the affected area. These are meant for external application and are alcoholic or oil-based solutions or emulsions containing therapeutic agents. Alcoholic liniments are used for its rubefacient, mildly astringent, counterirritant and penetrating effect while oily liniment are milder in action but are more useful in massage.

7. Cream

Definition–The creams can be defined as viscous liquid or semi solid emulsions of either o/w or w/o type. Creams may be used as medicinal purpose and cosmetic purpose. Creams like shaving cream, hand cream and foundation cream are o/w type where as cold creams are w/o type emulsion. The classification of creams which is widely accepted is based on function. According to its function the creams can be classified as below–

1. Foundation and vanishing creams
2. Cleansing and cold creams
3. Night and massage creams
4. Hand and body creams

5. All purpose and general creams

Of these types of creams mostly creams are of emulsion type except cleansing cream which may be of either type emulsion or mixture of hydrocarbon oils and waxes.

General procedure for manufacturing–As these preparations are emulsion type the ingredients are classified into aqueous phase and oil phase. Ingredients of oil phase having least melting point should be melt first and then remaining ingredient should be melt in increasing order of melting point. The continuous stirring should be done during this process. Ingredients of aqueous phase should be mixed separately. Then both of these phases are mixed with continuous stirring till a smooth cream is formed. Perfume should be added when it is cooled.

The ingredients of cream include bees wax, oil like almond oil, mineral oil, spermaceti, water, perfume and preservative.

8. Gel

Gels are semi solid masses that are formed by dispersion of lyophilic colloids at certain concentration specially when the solubility of the colloidal material is reduced by charge in temperature.

The USP has defined the gel as "Semi solid systems consisting of either suspensions made up of small inorganic particles or large organic molecules interpenetrated by a liquid. Where the gel mass consists of a network of small discrete particles, the gel is classified as a two-phase system. In two phase system, if the particle size of the dispersed phase is relatively large, the gel mass is sometimes referred to as a magma.

Gel preparation method–The gel can be prepared by following methods–

1. Chemical reaction that lead to the change in shape of lyophilic molecules.
2. Flocculation of lyophilic colloids by salt or precipitating liquids.
3. By evaporation–This is done in certain colloidal solution.
4. Swelling of dry colloid when placed in contact with soluble liquid.

Gelling agents–Acacia, alginic acid, starch, tragacanth, gelatin, carbomer, sodium starch glycolate etc. works as gelling agents.

Uses of gel–Gels are used in several formulations. Topic preparations for musculoskeletal systems for relief in pain or other anti-inflammatory activity, treatment of peptic ulcer with sucralfate gel, ophthalmic preparation of pilocarpine. For cosmetic purpose hair gels are very much used.

9. Pain Balm

Balm are semi solid dosage form that are genteelly rubbed over affected area. Balms may contain medicament along with bee wax oil like coconut oil, Sesame oil, linseed oil etc. colour and preservatives. For the preparation bee wax is heated so that it melts and then oils are added. Preservation are added while it cool to some extent. If camphor is used then it should be mixed in melted bee wax and oil base that it can be dissolve completely.

Need of dosage forms

1. Dose accuracy
2. Palatability of dosage form
3. Absorption, distribution and biotransformation of drug in the body
4. Stability against microbial action
5. Administration according to different route.

14 CHAPT.

GMP (Schedule T) and Regulatory Aspects of Ayurvedic Drugs

Syllabus

Brief overview of following- **Drug and Cosmetics Act** 1940 and Rules1945 import, manufacture, sale distribution of drugs and cosmetics standards of quality, misbranded, adulterated, spurious drugs and cosmetics as amended from time to time.

New Acts related to Drugs and Devices.

Good Manufacturing Practices (GMP) of ASU Drugs in accordance to Schedule- T.

Food Safety and Standards Authority of India (FSSAI) and FDA

Learning objective

1. Explain the legal and regulatory aspects of manufacturing, andsale of Ayurvedic drugs.
2. Describe acts and rules mentioned in Drug & Cosmetic Act 1940& Rule 1945 and their relevance to Ayurvedic, Siddha, Unani(ASU) drugs.
3. Discuss the guidelines of Food Safety and Standards Authority ofIndia (FSSAI) and FDA.
4. Determine the principles and practice of establishment ofAyurvedic pharmacy.
5. Discuss the NABL guidelines for testing laboratory (Chemical).
6. Explain long forms of these - (FSSAI) and(FDA),(CCRAS),(DCGI), (CDSCO).
7. Discuss ethical aspect of large scale drug preparation inAyurvedic Pharmacies.

Total -02 hours (Lecture :02 hour, Non-lecture: 04 hours)

Marks- 05 marks, LAQ (10 Marks)- No, SAQ (5 Marks)- Yes, MCQ- Yes

Approval Drugs

The Drugs and Cosmetics Act, 1940, is an act passed by Parliament of India by which import, Manufacture and distribution of drugs is controlled throughout India.

Historical background

During British period, 1920 in India, drugs having poor quality or adulterer drug were come in practise. This fact was raised by Sir Haroon Jafar in 1927 in Council of State. It was also raised by Sir Henery Grindey in Legislative Assemble at London. Keeping these facts into consideration. Drug enquiry committee was constituted in 1930 under presidentship of Col. R.N. Chopra. This committee has submitted its report to Government of India in 1931 saying that at present there is no law exist by which adulterated or spurious drugs can be controlled. There is need to form a Drug Act or Pharmacy act or both. After 9 years in 1940 the Drug Act was formed 1 Later on by amendment the world cosmetics was added to it since then it is known as the drugs and cosmetics Act 1940. Initially was applicable to allopathic drug but in 1963. Ayurvedic Drugs also comes under preview of this Act. Chapter described in the Drugs and Cosmetics Act. 1940 are –

Chapter I	Introductory
Chapter II	The Drugs Technical Advisory Board, The Central Drugs Laboratory and The Drugs Consultative Committee

Chapter III	Import of Drugs and Cosmetics
Chapter IV	Manufacture, Sale and Distribution of Drugs and Cosmetics
Chapter IVA	Provisions Relating to Ayurvedic, Siddha and Unani Drugs
Chapter V	Miscellaneous
The First Schedule	The Second Schedule

Note–Here in this chapter only those parts shall be described that are related to Ayurveda. These are described as per syllabus of BAMS and students can understand.

Where necessary the original description is given otherwise it is narrated in simple way to understood.

Definition of Ayurvedic Drug

Section 3 (a) ''Ayurvedic, Siddha or Unani Drugs'' includes all medicines intended for internal or external use for or in the diagnosis, treatment, mitigation or prevention of (disease or disorder in human beings or animals and manufactured) exclusively in accordance with the formulae described in the authoritative books of (Ayurvedic, Siddha and Unani Tibb systems of medicine) specified in the First schedule.

''Patent or proprietary medicine'' means

(i) In relation to Ayurvedic, Siddha or Unani Tibb systems of medicine all formulations containing only such ingredients mentioned in the formulae described in the authoritative books of Ayurveda, Siddha or Unani Tibb systems of medicine specified in the First Schedule, but does not include a medicine which is administered by parenteral route and also a formulation included in the authoritative books as specified in clause (a).

Chapter IV A– Provisions Relating to (Ayurvedic Siddha and Unani Drugs)

(Note– In this chapter from section 33-B to 33 are described which deals with ASU Drug Technical Advisory Board, Consultative Committee definitions of Misbranded, Adulterated and Spurious Drug, Government Analysts and Inspectors, Penalty for manufacture, sale of misbranded, adulterated and spurious drug, court under which it is punishable, power of central government to make rule etc. are described.

33- (Ayurvedic, Siddha and Unani Drugs Technical Advisory Board

The Central Government shall by notification in the official Gazettee and with effect from such date as may be specified there in, constiute a boared to be called as the (Ayurvedic, Siddha and Unani Drus Technical Advisory Board).

Function– The board will advise to the Central Government and the State Government on the technical matters arising out of the this chapter and to carry out the other functions assigned to it by this chapter.

(i) The Director General of Health Services, ex officio
(ii) The Drugs Controller, India, ex officio
(iii) The Principal officer dealing with Indian Systems of Medicine in the Ministry of Health, ex officio
(iv) The Director of the Central Drugs Laboratory
(v) One person holding the appointment of Government Analyst under section 34-F, to be nominated by the Central Government.
(vi) One Pharmacognosist*
(vii) One Phyto-chemist*
(viii) Four persons* (Two from amongst the members of the Ayurvedic pharmacopoeic committee, One amongst the members of Unani pharmacopoeic committee and one from amongst Siddha pharmacopoeia committee).
(ix) One teacher in Dravya Guna and Bhaishajya Kalpana*
(x) One teacher in ILM-UL-ADVIA and TAKLIS-WADAWASAZI*
(xi) One teacher in Gunapadam*
(xii) Three persons each one to represent the ASV drug industry*
(xiii) Three persons one each from among practitioners of Ayurvedic, Siddha and Unani Tibb systems of medicine*

* All star marks are to be nominated from Central Government. The Central Government

shall appoint a member of Board as Chairman. The period of board shall be of three years.

33-D The Ayurvedic, Siddha and Unani Drugs Consultative Committee

The Central Government may constitute an advisory committee to be called as The Ayurvedic Siddha and Unani Drugs Consultative Committee.

The work of this committee is to advise the Central Government, the State Governments as well as ASV Drug Technical Advisory Board on any matter for the purpose of securing uniformity throughout India in the administration of this Act in so for as it relates to Ayurvedic, Siddha or Unani Drugs.

This committee shall consists of two persons to be nominated by the Central Government as representatives of that Government and not more than one representative of each state to be nominated by the state Government concerned.

33-E. Misbranded drugs

For the purposes of this chapter, an Ayurvedic, Siddha or Unani drug shall be deemed to be misbranded–

a) If it is so coloured, coated, powdered or polished that damage is concealed, or it is made to appear of better or greater therapeutic value than it really if; or
b) If it is not labelled in the prescribed manner; or
c) If its label or container or anything accompanying the drug bears any statement, design or device which makes any false claim for the drug or which is false or misleading in any particular.

33-EE. Adulterated drugs

For the purposes of this chapter, an Ayurvedic, Siddha or Unani drug shall be deemed to be adulterated–

a) If it consists, in whole, or in part, of any filthy, putrid or decomposed substance; or
b) If is has been prepared, packed or stored under in sanitary conditions where by it may have been contaminated with filth or whereby it may have been rendered injurious to health; or
c) If its container is composed, in whole or in part, of any poisonous or deleterious substance which may render the contents injurious to health; or
d) If it bears or contains, for purpose if colouring only, a colour other than one which is prescribed; or
e) If it contains any harmful or toxic substance which may render it injurious to health; or
f) If any substance has been mixed there with so as to reduce its quality or strength.

33-EEA. Spurious drugs

For the purpose of this chapter, an Ayurvedic, Siddha or Unani drug shall be deemed to be spurious–

a) If it is sold, or offered or exhibited for sale, under a name which belongs to another drug; or
b) If it is an imitation of, or is a substitute for, another drug or resembles another drug in a manner likely to deceive, or bears upon it or upon its level or container the name of another drug, unless it is plainly and conspicuously marked so as to reveal its true character and its lack of identity with such other drug; or
c) If the label or container bears the name of an individual or company purporting to be the manufacturer of the drug, which individual or company is fictitious or does not exist; or
d) If it has been substituted wholly or in part by any other drug or substance; or
e) If it purports to be the product of a manufacturer of who it is not truly a product.

33-EEB.–Regulation of manufacture for sale of Ayurvedic, Siddha and Unani drugs.

No person shall manufacture for sale or for distribution any Ayurvedic, Siddha or Unani drug except in accordance with such standards, if any, as may be prescribed in relation to that drug.

33-EEC.–Prohibition of manufacture and sale of certain Ayurvedic, Siddha and Unani drugs.

From such date as the State Government may, by notification in the official Gazette, specify in this behalf, no person, either by himself or by any

other person or this behalf, shall manufacture for sale or for distribution–any misbranded, adulterated or spurious ASV drugs, any patent or proprietary medicine (It is not displayed true list of all ingredients in prescribed manner), without licenced there is also prohibition sell stock or exhibit or offer for sale or distribute any ASV drugs which has been manufactured in contravention of any of the provision of this Act or any rule made there under. However Vaidyas and Hakims who manufacture Ayurvedic, Siddha or Unani drug for the use of their own patients nothing is applied to them of the section.

33-EED–Power of Central Government to prohibit manufacture etc. of Ayurvedic, Siddha or Unani drugs in public interest.

(If central Government is satisfied without prejudice to any other provision contained in this chapter, that there is any risk to human beings or animals or dry do not have claimed therapeutic value then Central Government, may by notification in the official Gazette, Prohibit the manufacture, scale or distribution of such drug).

33-F. Government Analysts

The Central or State Government appoint such persons as it thinks fit having the prescribed qualifications to be Government Analysts for such areas by notification in the official Gazette but not the previous consent of the Government under is serving.

33-G. Inspectors

The Central or State Government appoint such persons as it thinks fit, having qualification to be Inspectors for such areas.

Any person having any financial interest in manufacture or sale of and drugs shall not be appointed to be a Government Analyst or Inspector.

33-H. Application of provisions of sections 22, 23, 24 and 25

Section 22 deals with– Powers of Inspectors

Section 23 deals with– Procedure of Inspectors

Section 24– Persons bound to disclose place where drugs or cosmetic are manufactured or kept.

Section 25 deals with reports of Government Analysts

33-I. Penalty for manufactors, sale etc of Ayurvedic Siddha or Unani drug in contravention of this chapter.

Manufactures for sale or for distribution

a) Any Ayurvedic, Siddha or Unani drug Punishable with

(i) Deemed to be misbranded under section 33-E imprisonment for a term

(ii) Deemed to be adulterated under section 33-EE which may extend to 1 year

(iii) without a valid licence (Under section 33-EEC with fine not less than 25000 rupees or 2 times value of confiscated drug which ever is more

(b) **Under section 33-EEA**– Punishable with imprisonment for a term which shall not be less than 1 year and may extend to 3 years with fine shall not be less than 5000 rupees or 8 times value of confiscated drug whichever is more.

Note– Court may impose imprisonment for a ten less than one year and fine less than 50,000 Rupees.

(c) **Under section 33 EED**– Imprisonment for a term which may extend to 3 years and fine which may extend to 3 years and fine which may extend to 50,000 rupees or 3 times the value of the drug confiscated.

(d) **Contravenes any other provision**– Imprisonment for a term of this chapter of section 24 may extends to 6 months and by section H– Imprisonment of a term may extends to 6 months and fine which shall not be less than 10,000 rupees.

33-J. Penalty for subsequent offences–

Whoever having been convicted of an offence

(a) **Clause (a) of sub section (1) of section I**– Imprisonment for a term which may extend to 2 years and with fine not less than 50,000 rupees or 3 times the value of drug confiscated.

(b) **Under clause (b) of sub section (1) of section I**– Shall be punishable with imprisonment for a term not less than 2 years and fine not less than one lakh rupees or three times the value of confiscated drug which ever is more. Court, for any adequate and special reasons, reduced it.

(c) **Under sub-section (2) of section**– Imprisonment for a term which may extend to 1 year and fine shall not be less than 25000 rupees or 3 times value of confiscated drugs.

33-K. Confiscation

33-KA. Disclosure of name of manufacture etc.

33-KB. Maintenance of records and furnishing of information.

33-L. Application of provisions to Government departments.

Except 33-K all other provisions shall be apply on Government departments too.

33-M. Cognizance of offences.

1. No prosecution under this chapter shall be instituted except by an Inspector.

2. No court inferior to that (of a Metropolitan magistrate or of a Judicial Magistrate of the first class) shall try an offence punishable under this chapter.

33-N. Power of Central Government to make rules

(Central Government has powder to make rule with the help of ASV Drug Technical Advisory Board).

33-O. Power to amend First Schedule

The First ScheduleThe First Schedule

A. (Ayurvedic and Siddha System)A.– (Ayurvedic and Siddha System)

S.No. Name of Book

1. Arogya Kalpadruma
2. Arka Prakasha
3. Arya Bhishaka
4. Ashtanga Hridya
5. Ashtanga Samgraha
6. Ayurveda Kalpdruma
7. Ayurveda Prakash
8. Ayurveda Samgraha
9. Bhaishjya Ratnavali
10. Bharat Bhaishjya Ratnakara
11. Bhava Prakasha
12. Brihat Nigantu Ratnakara
13. Charak Samhita
14. Chakra Datta
15. Gada Nigraha
16. Kupi Pakva Rasayana
17. Nighantu Ratnakara
18. Rasa chandanshu
19. Rasa Raj Sundar
20. Rasratna Samuchaya
21. (Rasatantra Sara Va Siddha Prayoga Samgraha-Part I)

21a. Rasatantra Sara Va Siddha Prayoga Samgraha-Part II (Edition 200)]

22. Rasa Tarangini
23. Rasa Yoga Sagar
24. Rasa Yoga Ratnakar
25. Rasa Yoga Samgraha
26. Rasendra Sar Samgraha
27. Rasa Pradipika
28. Sahasrayoga
29. Sarva roga Chikitsa Ratnam
30. Sarva roga Chikitsa Ratnam
31. Shrangdhar Samhita
32. Siddha Bhaishjya Manimala
33. Siddha Yoga Samgraha
34. Sushruta Samhita
35. Vaidya Chintamani
36. Vaidyaka Shabda Sindhu
37. Vaidyaka Chikitsa Sara
38. Vaidya Jiwan
39. Basava Rajeeyam
40. Yoga Ratnakara
41. Yoga Tarangini
42. Yoga Chintamani
43. Kashyapa Samhita
44. Bhela Samhita
45. Vishwanath Chikitsa
46. Vrindi Chikitsa
47. Ayurved Chintamani
48. Abhinava Chintamani
49. Ayurveda-Ratnakar
50. Yogaratna Samgraha

51. Rasamrita
52. Dravya guna nighantu
53. Rasamanjari
54. Bangasena

54.a Ayurvedic formulary of India and its parts)
54b. Ayurveda Sara Samgraha
54c. Ayurvedic Pharmacopeia of India
54d. Ayurvedic pharmacopeia of India and its parts)

Under the notification of The Drugs and Cosmetics Act 1940 dated 7th June 2017. The Ministry of Ayush, Government of India has decided to celebrate ''Ayurveda Day'' every year on the day of Dhanvantari Jayanti (Dhanteras).

The Drugs and Cosmetics Rules, 1945

The following part are related to Ayurvedic, Siddha and Unani Drugs.

Part XVI– Manufacture for sale of Ayurvedic (including Siddha) or Unani drugs– Rule 151 to Rule 160.

Part XVI (A)–Approval of Institutions for carrying out tests on ASU drugs and raw materials used in their manufacture on behalf of licensees for manufacture for sale of ASU drugs– Rule 160 A=160 J.

Part XVII–Labelling, packing and limit of Alcohol in Ayurvedic (Including Siddha) or Unani drugs– Rule 161-161B.

Part XVIII–Government Analysts and Inspectors for Ayurvedic (Including Siddha) or Unani drugs.

Part XIX–Standards of Ayurvedic, Siddha and Unani Drugs Rule 168-169.

Part XVI*

Manufacture for sale of Ayurvedic (Including Siddha) or Unani drugs). In this part licensing authorities, Application for licence and Loan license, certificate of renewal (Of license) its duration, Certificate of GMP, conditions for grant a renewal of licence, raw material record, guidelines for issue of license, form of free sale certificate, cancellation of license and identification of raw materials are described under Rule 151 to Rule 160.

Rule 151. Manufacture on more than one set of premises (each set of premises shall be obtain a separate licence)

152. Under this licensing authorities are appointed by state government

153. Application for licence to manufacture Ayurvedic (Including Siddha) or Unani drugs.

It is filled, in Form 24 D along with fees of rupees (two thousands for classical drugs and for proprietary drug three thousands for first ten products and additional fee of rupees two thousand per product) and given to Licencing authorities.The application should be submitted through e-AUSHADHI portal (www.e-aushadhi.gov.in).

153 A. Loan licence

It is filled in form 24-E along with fees of rupees (two thousands for classical drugs and for proprietary drug three thousands for first ten products and additional fee of rupees two thousand per product) and given to Licencing authorities. The application should be submitted through e-AUSHADHI portal (www.e-aushadhi.gov.in).

A loan licence means a licence which a licensing authority may issue to an applicant who does not have his own arrangements for manufacture but intends to avail himself of the manufacturing facilities owned by a license in Form 24-D.

153B. Application for certificate of Good Manufacturing Practices for Ayurvedic, Siddha or Unani Drugs manufacturing unit.

It shall be made in Form 24E-1 to the licencing authority along with a fee of rupees of five thousand. The application should be submitted through e-AUSHADHI portal (www.e-aushadhi.gov.in).

154. Form of licence to manufacture Ayurvedic (including Siddha) or Unani drugs.

If condition of Rule 157 is fulfilled then licence

shall be issued in Form 24 D). The application shall be processed through e-AUSHADHI portal (www.e-aushadhi.gov.in).

154 A. Form of loan licence to manufacture for sale of Ayurvedic (Including Siddha) or Unani drugs.

The application shall be processed through e-AUSHADHI portal (www.e-aushadhi.gov.in).

155. Omitted

155 A. Omitted

155 B. Certificate for award of G.M.P. of Ayurveda, Siddha and Unani drugs

It is issued to those who comply with the requirement of Good manufacturing practice of Ayurveda, Siddha and Unani drugs as laid down in Schedule T.

156. Duration for licence

(1) A licence issued in Form 25D shall remain valid perpetually: Provided that the licence shall submit a self-declaration of adherence to the conditions of licence and the provisions of the Drugs and Cosmetics Act and the rules made thereunder, every year from the date of issue of licence in form 25 D or from the date of submission of last self declaration, as the case may be .

Provided further that such self declaration shall be made within three months, of completion of one year from the date of issue of licence in form 25 D or from the date of submission of last self declaration, as the case may be, and in the event of non submission of such self declaration, within the time mentioned in the licence of the said product shall be suspended temporarily and if the licensee fails to submit the self declaration within a further period of three months, the licence of the said product shall be deemed to have been cancelled."

156 A. Duration of loan licence

156 B. Duration of Certificate of Good Manufacturing Practices for Ayurvedic, Siddha or Unani drugs manufacturing units

(1) A certificate issued in form 26E-1 shall remain valid unless it is cancelled by the Licensing Authority subject to deposit of a certificate retention fee of rupees one thousand before the expiry of a period of every succeeding five years from the date of its issue. (2) If the licence fails to pay certificate retention fee on or before the due date as referred to in sub-rule (1), he shall be liable to pay certificate retention fee along with a late fee calculated at the rate of two per cent of the certificate retention fee for every month or part thereof up to six months, and in the event of non-payment of such fee, the certificate shall be deemed to have been cancelled.

156 C. Inspection for grant of licence and verification of compliance

(1) Before a certificate in Form 26E-1 is granted, the licensing authority shall cause the establishment in which the manufacture of drugs is proposed to be conducted or being conducted to be inspected by one or more inspectors appointed by the State Government under this Act, with or without an expert in the field concerned and the inspector or inspectors shall examine the establishment intended to be used or being used for the manufacture of drugs. (2) The inspectors shall verify the self declaration of adherence to the conditions of licence and the provisions of the Drugs and Cosmetics Act and the Drugs Rules once in five years or as needed as per risk based approach. Provided that the inspectors are allotted the inspection duty in a randomized manner ensuring that the same inspector is not assigned inspection of a particular establishment consecutively for two terms of not less than five years duration. Provided further that if the premises is not inspected within the period of the validity of the GMP certificate or even after submission of retention fee, the GMP certificate shall be deemed to be continued for further term of five years.

156 D. Report by Inspector

(1) The Inspector or Inspectors shall examine all areas of the premises, plant and appliances and also inspect the process of manufacture intended to be employed or being employed along with the means to be employed or being employed for

standardizing and testing the drugs to be manufactured or being manufactured and enquire into the professional qualifications of the technical staff to be employed and he shall also examine and verify the statements made in the application in regard to their correctness, and the capability of the applicant to comply with the requirements of competent technical staff, manufacturing plants, testing equipment's and the Requirements of Good Manufacturing Practices and Plant and Equipment's as laid down in Schedule T. (2) The Inspector after completion of his inspection shall forward a detailed report giving his findings on each aspect of inspection along with his recommendations, to the Licensing Authority.

156 E.-Procedure of Licensing Authority

1) If the Licensing Authority after such further enquiry, if any, as he may consider necessary, and after being satisfied that the requirements of the provisions referred to in the rules under the Act have been complied with and that the conditions of the licence shall be observed, shall issue a licence under this Part.
2) If the Licensing Authority is not satisfied of the requirements under sub-rule (1), shall issue a memorandum of shortcoming, and the conditions which shall be satisfied before a licence is granted and shall supply the applicant a copy of the inspection report.
3) The applicant within two months of issue of such memorandum under sub-rule (2) shall reply the same.
4) On non submission of requirements under sub-rule (2), the Licensing Authority shall reject the application and shall inform the applicant, the reasons for such rejection.
5) For this purpose, the licensing authority shall intimate the applicant and process the application through portal eAUSHADHI (www.e-aushadhi.gov.in).

156F.- Further application after rejection

"If the applicant, within a period of six months from the rejection of an application for a licence or Certificate of Good Manufacturing Practices, as the case may be, informs the Licensing Authority that the conditions laid down have been complied with and deposit an inspection fee of rupees one thousand, the Licensing Authority may, after a further inspection, if any, is satisfied that the conditions for the grant of a licence or certificate have been complied with, issue a licence or certificate under this Part.".

157. Conditions for the grant of a licence in form 25-D

The following conditions shall be complied :

1. Drug should be made in hygienic conditions and follows the requirement as per Schedule T.
2. No manufacture shall use any prefix/suffix with name of drugs which are specified in Schedule I books.
3. Name of ASU drugs falling under class (a) of section 3 shall not be used for naming of any patent or proprietary medicine. If it has not in conformity with above condition (2 & 3) license should renew the licence with appropriate name of drug within a period of one year from the date of commencement of the drugs and cosmetics (4th amendment) rules 2015.

The manufacture should have a whole-time employee and who possesses the following qualification.

a) A degree in Ayurveda or Ayurvedic Pharmacy
b) A Diploma in ASU system of medicine
c) A graduate in Pharmacy/Pharmaceutical Chemistry/Chemistry or Botany with experience of at least two years in manufacturing in ASU system of medicine.
d) Registered Vaidya or Hakim having at least four years' experience in manufacturing of ASU drugs.
e) A qualification as pharmacist in ASU medicines with experience not less than eight years in manufacturing of ASU drugs.

157A. Maintaining of records of raw material used by licensed manufacturing unit of Ayurveda,

Siddha and Unani drugs in the preceding financial year (Each manufacturing unit should have to submit the record of raw drugs utilized in the end of current financial year in the proforma given in schedule TA to state drug licensing authority and to National Medicinal Plant Board before 30th June of succeeding financial year and one copy should be kept for himself.

"Provided that the applicant shall submit the record online through portal e-AUSHADHI (www.e-aushadhi.gov.in) as per the format provided in the said portal and such records shall be retained by the manufacturer for a period of one year after the submission.".

158. Conditions of licence

A licence in Form 25-D shall be subject to the conditions stated therein and to the following further conditions.

- License shall maintain proper records of manufacture and tests of raw material as well as finished product.
- Shall allow an Inspector to inspect the records, to take the samples of raw material and finished product.
- Shall maintain an inspection book.

The applicant and inspector shall submit the record online through e-AUSHADHI (www.e-aushadhi.gov.in) portal as per the format provided in the said portal.".

158 A. Conditions of loan licence

158 B. Guidelines for issue of license with respect to Ayurveda, Siddha or Unani drugs.

IA- Ayurveda, Siddha, Unani Medicines under section 3 (a)

B. Patent or proprietary medicine under section 3(h)

ii) Balya/Poshak/Muqawi/Unavuporutka 1/ Positive Health Promater formulations having ingredients mentioned in books of first schedule of the drugs and cosmetics Act, 1940 and recommended for promotional and preventive health.

iii) Saundarya Prasadak (Husane of 2a)/Azhagh-sadhan formulation having ingredients mentioned in Books of First Schedule of the Drugs and Cosmetics Act and recommended for Oral, Skin, Hair and Body care.

iv) Aushadha Ghana (Medicinal plant extracts– Dry/wet) extract obtained from plant mentioned in the books of first schedule of the Act including Aqueous or hydro-alcohol.

II(A)- For issue of licence to the medicine with respect to Ayurvedic, Siddha and Unani the condition relating to safety study and the experience or evidence of effectiveness shall be such as specified in columns (5) and (6) of the table given below–

S. no. 1	Category 2	Ingredient (S) 3	Indication (S) 4	Safety study 5	Experience/Evidence of Effectiveness 6	
					Published literature	Proof of effective
1.	ASU drugs given in 158-B as referred in 3 (a)	As per text	As per text	Not Required	Required	Not Required
2.	(B) Any change in dosage form of ASU drugs as described in 3(a) of Drugs and Cosmetics Act, 1940	As per text	As per text	Not Required	Required	Not Required
3.	(C) ASU, drugs referred in 3(a) to be used for new indication	As per text	New	Not Required	If Required	Required

II (B) for issue of license with respect to patient or proprietary medicine. The condition relating to safety and experience or evidence of effectiveness shall be specified as follows–

S. no. 1	Category 2	Ingredient (S) 3	Indication (S) 4	Safety study 5	Experience/Evidence of Effectiveness 6	
					Published literature	Proof of effective
1.	Patent or proprietary medicine	As per text	Textual rationale	Not required	Of ingredients	Pilot study as per relevant protocol for ASU drugs
2.	ASU drugs with any of the ingredients of schedule E(1) of the Drugs and Cosmetics Act 1940	As per Existing text	Required	Required	Required	

III. For issue of license of Balya and Poshak medicine

(i) Photo-copy of the textual reference of ingredients used in the formulation as mentioned in the book of 1st schedule.

(ii) Conduct safety studies if the product contains any of the ingredients as specified in Schedule E(1).

(iii) For textual indications the safety and effectiveness study is not applied.

(iv) For issue of license with respect to Saundarya Prasadaka.

IV. For issue of license with respect to Saundarya Prasadak

(i) Submit photo-copy of the textual reference of ingredients used in the formulation as mentioned in the book of I schedule.

(ii) Conduct safety studies, in the case the formulation contains of any of the ingredients as specified in the schedule E (1).

(iii) For textual indications the safety and effectiveness study is required.

For issue of license with respect to medicine Aushadh Ghana extract of medicinal plant (dry or wet)

S. no. 1	Category 2	Ingredient (S) 3	Indication (S) 4	Safety study 5	Experience/Evidence of Effectiveness 6	
					Published literature	Proof of effectiveness
1.	(A) Aqueous	As per text	As per text	Not Required	Not Required	Not Required
2.	(A1) Aqueous	As per text	New** indication	Not Required	Not Required	Required
3.	(B) Hydro Alcohol	As per text	As per text	Not Required	If Required	Not Required
4.	(B1) Hydro Alcohol	As specified	New** indication	Required	If Required	Required
5.	Other than Hydro/ Hydro Alcohol	As specified	As specified	Required acute, chronic mutagenicity and tertat-ogenicity	If Required	Required

** New indication means which in other than mentioned in I Schedule books of Drugs and Cosmetics Act. 1940.

158 C. Form of free sale certificate and non-conviction certificate

"Explanation.-For the purposes of this rule, the applicant shall apply online and licensing authority shall issue such certificate online through portal e-AUSHADHI (www.e-aushadhi.gov.in) as per the format provided in the said portal.".

159. Cancellation and suspension of licences

160. Identification of raw materials

Part XVI (A)

Approval of Institutions for carrying out tests on ASU Drugs and Raw Materials used in their manufacture on behalf of licenses for manufacture for sale of Ayurvedic, Siddha and Unani drugs.

160 A. Application for grant of approval for testing Ayurvedic, Siddha and Unani drugs.

Application for grant or renewal of approval for carrying out tests for identity, purity, quality and strength of ASU drug or raw materials shall be made in Form 47 to the Licensing Authority appointed by State Government provided that applicant shall furnish all the requirement needed for it.

160 B. Form in which approval to be granted for carrying out tests on Ayurvedic, Siddha and Unani drugs on behalf of licensees for manufacture of Ayurvedic, Siddha and Unani drugs and conditions for grant or renewal of such approval.

Above approval is granted in Form 48 provided the conditions like premises shall be well lighted and properly ventilated, shall be air conditioned should have adequate space and separate section for (i) Chemistry (ii) Pharmacognosy (iii) Ayurvedic, Siddha and Unani (iv) Microbiology (v) sample rooms (vi) Office cum record room as minimum area of 800 Sq.ft., Appointment of expert in Ayurveda, Chemist, Botanist with proper degree, should be fullfilled. List of equipment recommended is as follows :

Chemistry section

1. Alcohol determination apparatus
2. Volatile oil determination apparatus
3. Boiling point determination apparatus
4. Melting point determination apparatus
5. Refract meter determination apparatus
6. Polarimeter
7. Viscometer
8. Tablet disintegration apparatus
9. Moisture determination apparatus (IC filtrator)
10. U.V. Spectro photometer
11. Muffle furnace
12. Electric balance
13. Hot air oven (s)
14. Refrigerator
15. Glass distillation apparatus
16. Distillation equipment
17. Air conditioner
18. LPG Gas cylinder with burners
19. Water bath (Temp. controlled)
20. Heating mantle
21. TLC apparatus with all accessories
22. Sieves 10 to 120 with sieve shaker
23. Centrifuge machine
24. Dehumidifier (Where necessary)
25. pH meter
26. GLC with FI detector
27. Silica crucible
28. Tablet friability tester
29. Tablet dissolution tester
30. Other related equipment, reagent, chemical, glassware

Pharmacognosy Section

1. Microscope binocular

2. Dissecting microscope
3. Microtome
4. Chemical balance
5. Microslide cabinet
6. Aluminium slide trays
7. Hot air over
8. Ocular Micrometre
9. Stage micrometre
10. Camera Lucida Prism and Mirror type
11. Hot plates
12. Refrigerator
13. LPG Cylinder with burners
14. Other related equipment regent etc.

Microbiology SectionMicrobiology Section

1. Laminar air flow bench
2. B.O.D. Incubator
3. Plain incubator
4. Serological water bath
5. Over
6. Auto clave/Steriliser
7. Microscope (High powder)
8. Colony counter
9. Other related equipment & reagents

"(1A) The licence shall be issued within a period of two months, from the date of receipt of the application or from the date of fulfilment of shortcomings, if any, as the case may be, communicated by the licensing authority.".

160 C. Duration of approval (Shall valid for a period of three year from date of issue)

160 D. Condition of approval

160 E. Inspection before grant of approval

160 F. Report of inspection

160 G. Procedure of approving authority

160 H. Application after rejection

160 I. Renewal

160 J. Withdrawal and suspension of approvals

160K.-Information to be uploaded by the licencee on online portal.-

(1) The applicant or licence under this part shall register with portal, e-AUSHADHI (www.e-aushadhi.gov.in) and upload information, as per the format provided in the said portal, pertaining to licence application, renewal, tests carried out and other such information as required and shall be updated from time to time. (2) The information uploaded by the licensee in the portal under sub-rule (1) shall be verified by the concerned licensing authority.".

Part XVII

(Labelling, Packing and Limit of Alcohol in Ayurvedic (including Siddha) or Unani drugs.

161. Labelling, packing and limit of alcohol

Subject to the other provisions of these rules, the following particulars shall be either printed or written in indelible ink and shall appear in a conspicuous manner on the label of the inner container of any Ayurvedic Siddha or Unani and Patient and proprietary ASU drugs and on any other covering in which the container is packed namely.

(i) The name of the drug (For ASU drug) purpose the name shall be the same as mentioned in the authoritative books included in I schedule.
(ii) A correct statement of the net content in terms of weight (Should be in metric system)
(iii) The name and address of manufacturer
(iv) Manufacturing Licence Number
(v) Batch or Lot number
(vi) The date of manufacture
(vii) The word Ayurvedic medicine or Siddha medicine or Unani
(viii) The word 'For external use only' if the medicine is for external application.
(ix) Sample should be written as 'Physicians's sample not to be sold which shall be over printed.
(ix) Preparation (Asavas) with high content of alcohol as base
(x) Preparation (Asavas) with high content of alcohol as base

Name of drug	Maximum size of packing
(i) Karpurasava	15 ml
(ii) Ahiphenasava	15 ml
(iii) Mrgmadasava	15 ml

IX Preparation containing self generated alcohol

Name of the drug	Max. content of alcohol (ethyl alcohol v/v)	Max. size of packing
(i) Mritranjivani Sura	16%	30 ml.
(ii) Mahadrakshava	16%	120 ml.

161 A. Exemption in labelling and packing, provisions for export of Ayurvedic (including Siddha) and Unani drugs.

Labels and package of export drug may be adopted to meet the specific requirements of the law of the country to which it is exported. The following particulars shall be written.

(a) Name of drug
(b) Name of address of manufacturer and lic. number
(c) Batch and lot number
(d) Date of manufacture along with 'Best before use''
(e) Main ingredients if required by country
(f) For export

161 B. Shelf life-described in Part I

Part XVIII

Government Analyst and Inspectors for Ayurvedic (including Siddha) or Unani Drugs

162. Duties of Inspectors specially authorised to inspect the manufacture of ASU drugs.

162 A. Qualifications of the State Drug Licensing Authority for Licensing of ASU drugs.

163. Procedure for dispatch of sample to Government analyst and its receipt by the Government Analysts. (Pharmacopaeial laboratory for Indian Medicines to Function as Central Drugs Laboratry for the purpose of testing or analysis of Ayurveda, Siddha and Unani drugs)

163 A. Functions– The pharmacopoeial laboratory for Indian Medicine at Ghaziabad shall function as a Central Drugs Laboratory for the purpose of testing or analysis Ayurveda, Siddha and Unani Drugs.

Its functions shall be :

1. To develop pharmacopoeial standards and draft monograph and amendments along with standardized methods for the ASU drugs
2. To act as Central Appellate Drug Laboratory for testing of ASU drugs
3. To analyse or test such samples of ASU drugs as may be sent to it under sub-section (2) of section 11 or under sub-section (4) or section 25 of the Act.
4. To maintain reference museum and herbarium for the drugs used in ASU system.
5. To run a training centre for quality control methods in the ASU systems of medicines.
6. To carry out such other duties as may be entrusted to it by the Government of India.

163 B. The functions of Central Drugs Laboratory in respect of ASU drugs shall be carried out at Pharmacopoeial Laboratory for ASU medicine at Ghaziabad.

163 C. Despatch of samples for test or analysis
163 D. Recording of condition of seals
163 E. Report of result of test or analysis
163 F. Fees
163 G. Signature on certificates
164. Method of test or analysis to be employed in relation to ASU drugs
165. Qualification of Government Analyst
166. Duties of Government Analyst
167. Qualifications of Inspector

Part XIX

Standards of Ayurvedic, Siddha and Unani drugs

168. Standards to be complied with in manufacture for sale or for distribution of ASU drugs.

Class of drug	Standard to be complied
1. Drugs included in Pharmacop-oeia	The standard for identity, purity and strength as given in the additions of Ayurvedic Pharmacopoeia of India for the time being in force.
2. Asavas and Aristas	The upper limit of Alcohol as self-generated alcohol should not exceed 12% v/v excepting those that are otherwise notified by the Central Gover-nment from time to time

169. Permitted excipients - Permitted excipients like preservatives antioxidants, flavouring agents, chelating agents etc. shall be used in the permissible limits as prescribed in Indian Pharmacopoeia/Prevention of food Adulteration Act 1954/Food product order/Prureau of Indian Standard Act 1986.

Schedule E (1)

List of poisonous substance

1. Ahiphena
2. Arka
3. Bhallataka
4. Bhanga
5. Danti
6. Dhattura
7. Gunja (Seed)
8. Jaipala (Seed)
9. Karveera
10. Langali
11. Parasika Yavani
12. Vatsnabha/Shringi Visha
13. Visha mushti
14. Sarpa visha
15. Gauri pashana
16. Hartala
17. Manahshila
18. Parada
19. Rasa Karpura
20. Tuttha
21. Hingula

New act related to Drug and Device– At present in the Drugs and cosmetics Act 1940. Definition of drug, device as well cosmetics is given. At present the Drug Rule 1945, Medical Devices Rule, 2017 and Cosmetics Rule 2020 has been implemented. Related part of Drug Rule 1945 and Cosmetic Rule 2020 has been described in earlier chapter and in this chapter. Medical Device Rule 2017 is completed in twelve chapters and eight schedule. In which definition of device Licensing Authority, Central Medical Devices testing laboratory, Regulation of Medical Device, Authorities officers and Bodies, Import of medical devices and its labelling, evaluation of new in Vitro diagnostic medical device etc. are described. However draft of New Drugs, Medical Devices and Cosmetics Bill, 2022 has been brought before the Parliament. After that it will replace the existing Drug Act. This bill comprises of seven chapters and nine schedule. ASU drugs are described in Chapter V namely provisions relating to Ayurveda, Siddha, Sowa Rigpa Unani and Homeopathic Drugs and in Schedule V the list of books is given.

Good Manufacturing Practices (GMP) of ASU Drugs in accordance to Schedule- T

In recent times much emphasis has been focused on the quality, purity and efficacy of Ayurvedic drugs. Pharmacy should have G.M.P. certificate for sale or distribution etc. of Ayurvedic, Siddha and Unani drugs. For this purpose, Government of India by G.S.R. 198 (E) dated on 7 March 2003 mode an amendment in The Drugs and Cosmetics Rules 1945. By this amendment Rule 155 B was inserted after Rule 155 A. In Rule 155 B there is provision of award of Certification of G.M.P. for Ayurvedic, Siddha and Unani drugs. This certificate of GMP is issued in Form 26E-1 after 3 months from the date application is given.

Need of Good Manufacturing Practice– The Good Manufacturing Practices (GMP) are prescribed as follows in Part I and Part II to ensure that–

i) Raw materials used in the manufacture of drugs are authentic, of prescribed quality and free from contamination.
ii) The manufacturing process is as has been prescribed to maintain the standards.
iii) Adequate quality control measures are adopted.
iv) To achieve the objectives listed, above, each license shall evolve methodology and procedures for following the prescribed process of manufacture of drugs which should be kept for reference and inspection. However, under IMCC Act, 1970 registered Vaidyas, Siddhas and Hakeems who prepare medicines on their own to dispense to their patients and not selling such drugs in the market are exempted from the purview of GMP.

Part I

Good Manufacturing PracticesGood Manufacturing Practices

The manufacturing plant should have adequate space for–

i) Receiving and storing raw material
ii) Manufacturing process area
iii) Quality control section
iv) Finished goods store
v) Office
vi) Rejected goods/drug store

Note– GMP covers all the requirements that are needed for the production of medicine having quality, purity and strength. These requirement may be categorised as follows–

1. Related to Building (1.1 A, B, C, D and E)
2. Related to packaging material
3. Related to stores (1.1 F (A) (B) (C)
4. Health and hygiene of workers
5. Machinery and equipment's.
6. Related to drugs like records batch, manufacturing market complaint and quality control.

Building of Aushadhi Nirmanshala

The factory buildings for manufacturing of Ayurveda medicines shall be so situated and shall have such construction as to avoid contamination from open sewage, drain, public lavatory or any factory which produces disagreeable or obnoxious odour of fumes or excessive soot, dust or smoke.

Building shall be such designed, constructed and maintained to prevent entry of insects/rodents and free from cobwebs. Its walls, floors and ceiling shall be smooth and free from cracks so that easy cleaning and disinfection cab be done. Drainage system in the processing area should be proper avoid the retention of waste materials. Proper ventilation, fire safety measures and exits should be there. There should be separate space for drying of raw materials, in process medicines and it is protected from flies, insects, dusts etc. water used in processing shall be pure and of potable quality. Adequate arrangements for washing cleaning and drying of glass bottles, vials, jars its should be present.

Stores– Stores should have proper ventilation and shall be free from dampness. For keeping different types of material separate stores with adequate space should be there. Separate store for keeping raw material, packaging material and finished products should be present.

Raw material store

All the raw materials procured for manufacturing will be stored in the raw materials store. These should be kept in the container according to their nature to protect the quality as well as from damage but to dampness, microbiological contamination or rodent and insect infestation etc. Different types of raw materials should be kept in different cabin or areas and it can be designed to handle the following different categories of raw materials.

1. Raw material of metallic origin
2. Raw material of mineral origin
3. Raw material from animal source
4. Fresh herbs
5. Dry herbs or plant parts

6. Excipients etc.
7. Volatile oils/perfumes & flavours
8. Plant concentrates/extracts and exudate/resins.

Label should be used for each container to identify the drug. Under test or approved or Rejected drugs should be labelled properly.

Procedure of ''First in first out'' should be adopted for raw materials wherever necessary. Records of testing approval, rejection should be maintained properly.

All the packaging materials like bottles, jars etc. shall be stored properly. After preparation of medicine it should be kept within an area marked 'Quarantine' till it passes the quality control parameter. After that it will moved to ''Approved finished Goods stock'' area. Distribution records shall be maintained as required.

Machinery/Equipment's and working space

Depending upon size of operation and the nature of product manufactured the following equipment's may be adopted.

1. Manually operated
2. Semi-automatic
3. Fully automatic

These are used for the process of manufacturing like crushing, powdering, boiling, mashing, roasting, filtering etc. The manufacturing area shall provide adequate space between machines and for keeping the raw material to avoid the possibility of cross contamination and ease in the movement of workers and orderliness in operations. Proper standard operational procedure (SOP) for cleaning, maintaining and performance of every machine should be laid down.

Health, clothing, Sanitation and Hygiene of workers

All the workers who are working in the Aushahda NirmanshalA should be free from contagious diseases. Their uniform will be clean and suitable to nature of work and climate and also include cloth or synthetic coverings for hand, feet and head wherever required.

Separate toilet should be made to be used by men and women and it should be located separately from the processing room worked will also be provided facilities for changing their cloths. Medical examination of all the workers should be carried out by a physician once a year. First aid facility should be present.

Records of Batch Manufacturing and Distribution

The license shall maintain batch manufacturing record of each batch irrespective of the type of product manufactured. Records of raw materials issued, its quantity, quality tests like physical characteristic, chemical tests, details of transfer of manufactured drugs along with record of testing of the finished product should be maintained. It should be necessary to maintain the record of date, manpower, machine and equipment's used and to keep in process record of various process like Shodhana, Bhavana etc. Records of sale and distribution of each batch shall be maintained in order to facilitate prompt and complete recall of the batch, if necessary. Record should be kept till the date of expiry of batch. Drugs having long shelf live or Rasa category record should be kept for five years.

Record of market complaints

Record of market complaints should be maintained in a register. Data of market complaints, investigations carried out by the manufacture regarding complaint and action taken should be maintained. Reports of any adverse drug reaction should be maintain in a separate register.

Quality control

The quality control section shall verify all the raw materials, monitor in process, quality checks and control the quality of finished product being released to finished goods store/ware house. The quality control section shall have the following facilities–

1. There should be 150 sq. feet area for quality control/section.
2. For identification of raw drugs, reference books and reference samples should be maintained.
3. Manufacturing record should be maintained for the various processes.
4. To verify the finished products, controlled samples of the finished products of each batch will be kept till the expiry date of product.
5. To supervise and monitor adequacy of condition under which raw drug, processed drugs are stored.
6. Keep record in establishing the shelf life and storage requirements for the drugs.
7. Specification and control references of manufacturing patent proprietary medicines.
8. Records of Bhawana, Mardana and Puta.
9. Standards for identity, purity and strength and given in Pharmacopoeia published by Government of India shall be complied with.
10. All raw materials will be monitored for fungal, bacterial contamination with a view to minimise such contamination.
11. Quality control section will have a minimum of expert of Ayurveda, Chemist, Botanist with proper degree.

For manufacture of sterile product separate enclosed areas specifically designed for the purpose shall be provided. These areas shall be provided with air locks for entry and shall be essentially dust free and ventilated with an air supply. For all areas where aseptic manufacture has to be carried out air supply shall be filtered through bacteria retaining filters (Hepa filters) and shall beat a pressure higher than in the adjacent areas. Proper precations should be taken during manufacturing and packing of drugs.

Precautions against contamination and mix

(a) Carrying out manufacturing operations in a separate block of adequately isolated building or operating in an isolated enclosure within the building.

(b) Using appropriate pressure differential in the process area.

(c) Providing a suitable exhaust system.

(d) Designing laminar flow sterile air system for sterile products.

(e) The germicidal efficiency of UV lamps shall be checked and recorded indicating the burning hours or checked using intensity.

(f) Individual containers of liquids and ophthalmic solutions shall be examined against black-white background fitted with diffused light after filling to ensure freedom from contamination with foreign suspended matter.

(g) Expert technical staff approved by the Licensing Authority shall check and compare actual yield against theoretical yield before final distribution of the batch.

All process controls as required under master formula including room temperature, relative humidity, volume filled, leakage and clarity shall be checked and recorded.

PART-II

A. List of Recommended machinery, Equipment and minimum manufacturing premises required for the manufacture of various categories of Ayurvedic, Siddha system of medicines

One machine indicated for one category of medicine could be used for the manufacturing of other category of medicine also. Similar some of the manufacturing areas like powdering, furnace, packing of liquids and Avaleha, Paks, could also be shared for these items.

Sl. No. (1)	Category of Medicines (2)	Minimum manufacturing space required (3)	Machinery/equipment recommended (4)
		1200 Square feet covered area with separate cabins or partitions for each activity. If Unani medicines are manufactured in same premises an additional area of 400 sq. feet will be required.	
1.	Anjana/Pisti	100 sq. feet	Karel/mechanized/motorized, karel, End runner/Ball-Mill Sieves/Shifter.
2.	Churna/Nasya/Manjan/ Lepa/Kwath churn	200 sq. feet	Grinder/disintegrator/Pulveriser/ Powder mixer/sieves/shifter.
3.	Pills/Vati/Gutika	100 sq. feet	Ball mill, Mass mixer/powder mixer, Granulator, drier, tablet compressing machine, pill/vati cutting machine, stainless steel trays/container for storage and sugar coating, polishing pan in case of sugar-coated tablets, mechanised chattoo (for mixing guggulu)where required.
4.	Kupi pakava/ksara/ Parpati/Lavana bhasma Satva/Sindura karpu/ Uppu/Param	150 sq. feet	Bhatti, Karahi/Stainless steel Vessels/Patila Flask, Multani Matti/ Plaster of Paris, Copper Rod, Earthern container, Gaj Put Bhatti, Mufflefurnace (Electrically operated) End/Edge runner, Exhaust Fan, Wooden, S.S. Spatula.
5.	Kajal	100 sq.feet	Earthern lamps for collection of Kajal, Triple Roller Mill, End Runner, Sieves, S.S. Patila, Filling/packing and manufaturing room should be provided with exhaust fan and ultra violet lamps.
6.	Capsules	100 sq. feet	Air Conditioner, De-humidifier, hygrometer, thermometer, Capsule filling machine and chemical balance.
7.	Ointment/ Marham Pasai	100 sq. feet	Tube filling machine, Crimping Machine/ Ointment Mixer, End Runner/Mill (Where required) S.S. Storage Container S.S. Patila.
8.	Pak/Avaleh/ Khand/Modak/ Lakayam	100 sq. feet	Bhatti section fitted with exhaust fan and should be fly proof, Iron Kadahi/ S.S. Patila and S.S. Storage container.
9.	Panak, Syrup/Pravahi kwath Manapaku	150 sq, feet	Tincture press, exhaust fan fitted and fly proof, Bhatti section, Bottle washing machine, filter press/ Gravity filter, liquid filling machine, P.P. Capping Machine.

10. Asava/Arishta	200 sq. ft	Same as mentioned above. Fermentation tanks, containers and distillation plant where necessary, Filter Press.
11. Sura	100 sq. ft	Same as mentioned above plus Distillation plant and Transfer pump.
12. Ark Tinir	100 sq. ft	Maceration tank, Distillation plant, Liquid filling tank with tap/Gravity filter/Filter press, Visual insepection box.
13. Tail/Ghrit Ney	100 sq. ft	Bhatti, Kadahi/S.S. Patila S.S. Storage Containers, FIltration equipment, filling tank with tap/Liquid filling machine.
14. Aschyotan/Netra Malham Panir/Karm Bindu/Nasabindu	100 sq. ft	Hot air oven electically heated with thermostatic control, kettle gas or electrically heated with suitable mixing arrangements, collation mill, or ointment mill, tube filling equipment, mixing and storage tanks of stainless steel or of other suitable material sintered glass funnel, seitz filter or filter candle, liquid filling equipment, autoclave.
15. Each manufacturing unit will have a separate area for Bhatti, furnace boilers, puta, etc. This will have proper ventilation, removal of smoke, prevention of files, insets, dust etc. The furnace section could have tin roof.	200 sq.ft	

C. List of equipment recommended for in house quality control section

(Alternatively, unit can get testing done from the Government approved laboratory)

(A) Chemistry section	(B) Pharmacognosy section
1. Alcohol determination apparatus (Complete set)	1. Microscope Binoculor
2. Volatile oil determination apparatus	2. Dissecting Microscope
3. Boiling point determination apparatus	3. Microtome
4. Melting point determination apparatus	4. Physical balance
5. Refractometer	5. Aluminium slide trays
6. Polarimeter	6. Stage micrometer
7. Viscometer (Prism and Mirror type)	7. Camera Lucida

8. Tablet disintegration apparatus 9. Moisture meter 10. Muffle furnace 11. Electronic balance 12. Magnetic Stirrer 13. Hot air oven 14. Refrigerator 15. Glass/Steel distillation apparatus 16. LPG Gas cylinders with burners 17. Water bath (Temperature controlled) 18. Heating mantles/Hot plates 19. TLC apparatus with all accessories (Manual) 20. Paper chromatography apparatus with accessories. 21. Sieve size 10 to 120 with sieve shaker 22. Centrifuge machine 23. Dehumidifier 24. pH Meter 25. Limit Test Apparatus.	8. Chemicals, Glassware etc.

Note– The above requirements of machinery, equipment's, space are made subject to the modification at the discretion of the licensing authority, if he is of the opinion that having regard to the nature and extent of the manufacturing operation it is necessary to relax or alter them in the circumstances in a particular case.

SCHEDULE TA – related to guidelines for Rasaushadhi

Manufacturing process areaManufacturing process area

For the manufacture of Bhasma and Kupipakwa and other preparation of metals and minerals the following specific areas shall be provided which should be completely separated from the production area where preparation of plants and animal origin are made to avoid cross contamination. The following areas are required.

a) Bhatti or Heating Device Section for Bhasma and Rasaushadhies– 100 sq. feet for heating, burning, Puta and any heat related work with proper ventilation, exhaust and chimney.

b) Grinding, Drying and Processing Section for Bhasma and Rasaushadhies - 100 sq. feet. Drying should be done in a space which is covered by glass or other transparent material to allow entry of Sunrays on the material.

c) Rasaushadhi related store– 100 sq. feet

The size and dimensions of Bhatti section would be so designed to suit the batch size. Fuels like coal, fire wood. Cow dung cakes etc. and other heating devices like electrical heating, oil or gas fired furnaces and other shall be employed so as to provide the required temperature as per the nature of material and object of heating. The manufacturing area should be designed with special attention to process the products that generate toxic fumes like SO_2, arsenic and mercury vapur etc. Since processing of these materials may introduce heavy metal contamination so cleaning of equipment is very important after each process with suitable cleaning agent.

During the manufacturing of Rasaushadhis the materials used like Uplas furnace electricity their record should be maintained for the process of Puta or other heating process temperature record should be kept this purpose pyrometer should be employed.

Quality control

This should be done on two level :

A. In Process Quality Control

B. Product Quality Control

A. In Process Quality Control

The registers as indicated below should be maintained

a. Shodhana Register with following details

- Sl. No.
- Batch no. and size
- Date, time and duration
- Name of Raw-material with quality reference and quantity.
- Quantity of Shodhana Dravya
- Book reference followed
- Methodology

b. Bhavana and Puta Register

- Sl. No.
- Batch No. and Size
- Date, time
- Name of the material and quantity of starting material
- Quantity of Nirvapa Dravya
- Quantity of Bhavana Dravya
- Date and time of starting and completion of Bhavana or Mardana and duration.
- Type and number of Puta
- Time and date of completion of Puta
- Colour and texture of the product
- In process tests followed (Bhasma Pariksha and others)
- In case heating at a particular temperature is needed record of that temperature.

c. Grinding Records Register

- Sl. No.
- Batch No.
- Date and time
- Name of the material and quantity
- Name of the equipment (SS/granite)
- Duration of grinding
- Repeat the grinding if required

d. Packing details

- Name of Rasaushadhi
- Type of dosage form eg. pill, powder etc.
- Weight of Rasaushadhi in each unit.

"SCHEDULE TB (Refer sub-rule VI of Rule 158 B) Guidelines for development of nasal spray as dosage form for Ayush, Siddha, Unani and Homoeopathy Drugs I.

Introduction - Any medicine administered through the nose (Nasika) is considered Nasya (Nasal administration) in Ayurveda. Usually, all the clinical conditions related to head and neck (Urdhwajatrugatavikara) are treated by following Nasyaas the main line of treatment. In conditions like Apasmara and Unamada, procedures like Pradhamana nasya provide instant relief by reflex or systemic action.

There are several varieties like Snehana Nasya (medicated oil / ghee used as nasal drops), Shamana Nasya (fresh herbal juices / decoctions used for nasal administration), Avapeedana Nasya(fresh herbs squeezed and the juice used as nasal drops), Pradhama Nasya(powdered herbs forcedly sprayed into the nose) and Dhumana Nasya (medicated fumes inhaled). For example, Anutaila nasya is indicated for daily usage; Dadimapushpa svarasa/ durva svarasa is used in Nasagata Raktapitta (ĕpistaxis); Avapeedana Nasya is used in Ardhavabhedaka; Trikatu churna or Pippali churna is used as Nasya in Apasmara. The Nasya procedures like Snehana, Avapeedana Nasyaetc. are used in the gravitational direction as the other methods like Dhumananasyaand Pradhamananasya are used against gravitational force. Acharya Charaka contraindicated herbs like Kushtha (Saussurea lappa D C Clarke) and Tagara (Valeriana wallachii DC) from using in Shiro-virechana. This shows the safety consciousness of Ayurveda practice.

In Siddha system, Nasiyam (Nasal drops) and Nasika aparanam (Medicated snuff) are the types of external medication applied through nostrils. Nasiyam (Nasal instillation) is a process of instillation of drugs in liquid form through the nostrils while Nasika aparanam (medicated snuff) is inhalation of medicated substances in powder form. In the Unani system, various nasal dosage forms are used and most are nervine tonics and stimulants, especially helpful in neurological

diseases. Dosage form of Nasal drop or fine powder used in the Unani system of Medicine comes under Drug & Cosmetic Act (Reference- IlajulAmraz Page No. 189-190, 193, 196-201).

- Saoot (Nasal drop)/Qutoor: A liquid preparation which is used as nasal drop
- Shamoom: Smelling of the drugs which may be in dry or liquid form so that volatile substances reach the nasal cavity and respiratory tubes
- Nashuq/Naswar (Insufflation): A liquid preparation or powder that is used for insufflation
- Bakhoor/Dhuni (Fumigation): Smoking an affected organ by burning the drugs In Homeopathy system, administration of medicine through nasal route is mentioned under authoritative books of Homoeopathy medicines. .

II. Definition A nasal spray is a liquid/powder formulation dispensed as a fine spray from a container/device into the nostril. In this combination of formulation and device, the end user sprays the nasal spray formulation into the nostril while breathing in through his/her nose. Nasal sprays are used to deliver medications locally in the nasal cavity.

III. Differentiation from nasya Though the route of administration for Nasya and Nasal Spray is the same (nose), the main differentiating aspect between traditional Nasya and the new dosage form of Ayush nasal spray is that "in the traditional method medicated juices/oils are administered through the nasal route without the support of any specialised instrument/ device. Whereas the nasal spray is administered by using a specific device". The present definition or introduction of Nasal Spray shall not interfere with the existing Nasal drops used in the form of oils or decoctions etc. The respective existing nasya methods shall continue. The medication standards for those items remain to be the same as indicated in the Ayurvedic Pharmacopoeia of India (API), Part-II (example for Anutaila and Shadbindutaila). The Standard Operating Procedures (SOPs) for the performance of Nasya shall also be the same as those developed by CCRAS at National Institute for Panchakarma, Cherthurthy, Kerala. The standards for the new dosage form "Nasal Spray" and the guidelines for the usage of the new device are defined in this document.

IV. Guidelines for active ingredient selection Active Ingredients should be selected as per the definition of ASU Drugs in Section 3(h) under the Drugs and Cosmetics (D&C) Act, 1940 and Rules 1945.

V. Guidelines for excipient selection Selection of excipients should be as per the provisions and terms and conditions provided under Rule 169 of the D&C Rules, 1945 and amendments therein.

VI. Specifications for the device (As per the details provided by the manufacturer) -The following quality parameters provide guidance for the selection of packaging material. The data for these parameters can be obtained from the packaging material supplier and consistency across the manufacturing lots can be confirmed, based on the certificate of analysis.

Sr. No.	Parameter	Description	Specifications/Limit
1	Material of construction of Bottle	Glass, HDPE or Suitable and compatible material	Specify
2	Bottle dimensions	ReferAnnexure1for details	Specify
	Details for Pump and Actuator (with dust cap) / other components		
3	Name and Material of construction of Pump	Suitable and compatible material	Specify
4	Pump dimensions	Refer Annexure 1 for details	Specify

5	Material of construction of	Suitable and compatible material	Specify
6	Dimensions of Actuator & Dust cap	Annexure1 for details	Specify
7	Priming and Repriming		Specify (Shot weight should be between90% to 110%)

VII. Specifications for the finished product (mandatory)

S.No.	Parameter	Specifications/Limit
1	Description	A qualitative description of the dosage form should be provided (e.g., size, shape,and color)
2	Assay of Active ingredients	Basis vendor CoA of Raw material Specification or Extract Specification or Pharmacpoeial reference or Using Pharmacopeial method
3	Assay of Preservatives and Stabilizing excipients	Content limits of 90-110%
4	Pump Delivery (Liquid dosage form)	Weight delivery acceptance criteria should control the weight of the individual sprays to within "15 percent of the target weight and their mean weight to within "10 percent of the target weight. However, for small dosage pumps(e.g.,20mL) other acceptance criteria maybe justified
5	Net Content	Basis number of dose requirement
6	pH value (Liquid dosage form)	The pH or apparent pH, as appropriate, of the formulation should be tested and an appropriate acceptance criterion to be established
7	Osmolality (Liquid dosage form)	The osmolality of the formulation should be tested and controlled during release of product with an appropriate procedure and acceptance Criterion, as applicable based on the ingredients used
8	Microbial / Microbiological limits	Pharmacopeia of concern system, Coliforms– Absent
9	Number of actuations per container	The number of actuations per container should be demonstrated to be not less than the labelled number of actuations.
10	Heavy Metals	Pharmacopiea of concerned system
11	Pesticide Residues	Pharmacopiea of concerned system
12	Aflatoxins	Pharmacopiea of concerned system
13	Moisture Content (Powder dosage form)	The limit for moisture content should be established based on results seen in stability studies. If the results are stable throughout the shelf life of the product, or if any changes in moisture content do not result in changes to any other parameters, it may be acceptable to omit this test from the specification; this should be fully explained in the Justification of Specification(s) section.

VIII. Specifications for the finished product (optional)

S.No.	Parameter	Specifications/Limit
1	Droplet Size Distribution / Particle Size Distribution*	If a laser diffraction method is used, droplet size/ particle distribution can be controlled in terms of ranges for the D10, D50, D90, span[(D90 -D10)/D50], and percentage of droplets less than 10 mm. For nasal sprays, mean D10, D50, D90 values for a given bottle or canister can be computed from the mean of up to three consecutive sprays from that unit at each life stage. However, to assess precision, the data of each spray would also be reported. Single spray droplet size distribution and span would be reported based on volume (mass) rather than count (number of droplets). The data be provided for nasal sprays at: Fully developed phase only, Two distances from the actuator orifice. For the increased ability to detect potential differences between products, it is recommended that the studies be performed within a range of 2 to 7 cm from the orifice, with the two distances separated by 3 cm or more. Other Methods that can be used: Microscopy, Cascade impactor, and Laser Diffraction.
2	Aerodynamic Particle Size measurement (Powder dosage form)	The Particle or droplet size distribution in the plume discharged from inhalation aerosols and sprays and the particle size distribution in the cloud discharged from inhalation powders are the important characteristics used in judging product performance. Although particle size measurement by microscopy can be used to evaluate the number of large particles, agglomerates, and foreign particles in the emissions of inhaled aerosols and sprays, whenever possible, this test should be replaced with a method to determine the aerodynamic size distribution of the drug aerosol leaving the product.
3	Spray Pattern	The acceptance criteria for the spray pattern should include the shape (e.g., ellipsoid of relative uniform density) as well as the size of the pattern (e.g., no axis is greater than x millimeters and the ratio of the longest to the shortest axes should lie in a specified range, for example, 1.00 - 1.30). Data should be provided to demonstrate that the collection distance selected for the spray pattern test will provide the optimal discriminatory capability. For nasal sprays, these distances are recommended to be at least3cmapartwithin the range of 3to7 cm.
4	Plume Geometry	Plume geometry describes a side view of the aerosol cloud parallel to the axis of the plume, and we recommend it be based on high-speed photography,

		a laser light sheet and high- speed digital camera, or other suitable methods. Plume geometry can be evaluated by a variety of procedures (e.g., the time sequence sound-triggered high speed flash photography method, videotape recording and taking pictures of different frames).Photographs should be of high quality. The approaches used should allow monitoring the plume development to define the shape (e.g., two side views, at 90ã to each other and relative to the axis of the plume) of the individual spray plume over time. Plume geometry would be performed at: Beginning life stage only, One side view only, A single delay time. We recommend plume geometry measurements be summarized as mean, geometric mean, and %CV.
5	Effect of Dosing Orientation	Determine the comparative performance of the devices in terms of Spray Content Uniformity and particle/droplet size distribution at various dosing orientations
6	Profiling of Sprays Near Container Exhaustion (Tail off Characteristics)	Determine the profiles of Spray Content Uniformity and droplet/ particle size distribution of each individual spray after the point at which the labeled number of sprays have been dispensed until no more sprays are possible (i.e., the container is empty.
7	Effect of Storage on the ParticleSize	Particle size distribution to be evaluated
8	Effect of Resting Time	Determine the effect of increasing resting time on the first spray of unprimed units, followed immediately by the second and the third sprays. Uniformity of the formulation delivered in the first, second and third spray (no priming) should be determined

IX. One-time studies as part of Product Development (to be submitted along with the license applied) Mandatory

For the most part, these should be one-time studies, preferably performed on multiple batches (e.g. three or more) of the product, representative of the product intended for distribution.

S.No.	Parameter	Description
1	Priming and Repriming inVarious Orientations (Liquid dosage form)	Determine number of Sprays recommended to prime or reprime the unit and approximate interval that can pass before the drug product should be reprimed.
2	Temperature Cycling	Determine effect of variation in temperature on finished goods parameters, as applicable.
3	Preservative Effectiveness test	If preservatives are used n the formulation, the minimum content limit should be demonstrated as microbiologically effective by performing amicrobial challenge assay.

4	Stability Studies	Standard Stability Studies shall be conducted. Optional: Photostability studies should be performed using appropriate test conditions, if warranted by the immediate container, i.e., the formulation in the primary container can receive light exposure. These studies should be conducted in the absence of any additional packaging(e.g., foil overwrap)
5	Cleaning Instructions	Through in-use studies determine the frequency and instructions for cleaning
6	Drug Deposition on Mouthpiece and/or	The purpose of these studies is to determine the
	Accessories (Powder dosage form)	amount of drug deposited within the device constituent part during use, which can relate to cleaning requirements. Study Design: Measure the mean amount of drug deposited per actuation on the mouthpiece or other device constituent part components (e.g., spacers or valved holding chambers).
7	Specific Rotation (Powder dosage form)	As applicable, based on the pure form of active used.
8	Robustness (Powder dosage form)	Vibrational stability of powder mixtures should be demonstrated, in order to simulate vibrations during transport and use. Significant variations in the delivered dose and/or fine particle mass should be fully discussed in terms of the safety and efficacy of the product.
9	Weight Loss	Nasal spray products should include acceptance criteria for weight loss during stability
10	Leachable (Liquid dosage form)	The Ayush product should be evaluated for compounds that leach from elastomeric or plastic components of the container closure system or justified otherwise.
11	Spray content uniformity(SCU)	The spray discharged from then as alactuator should be thoroughly analysed for the Ayush active content. This should be performed using individual container, between containers and multiple batches. Suitable in house analytical methods may be deployed and communicated to the Ayurveda, Siddha and Unani Licensing Authority.

X. Stability Guidelines

As per the guidelines provided in concerned Pharmacopeia.

XI. Safety and Efficacy Studies

Broadly safety and efficacy studies need to be conducted as per the guidelines provided in Rule 158(B) of the Drug and Cosmetics Rules, 1945 and Amendments as well as those provided in General Guidelines for Safety/Toxicity Evaluation of Ayush formulations, CCRAS, Ministry of Ayush, Govt. of India.

As per the requirement, safety/toxicity of the intended therapeutic formulation in its final form must be justified through appropriate means as relevant, such as ingredient literature as per text, indication (e.g. textbook rationale), classical medicine or proprietary medicine, hydro-alcoholic extract or other, mucosal irritation test on experimental animals and/or clinical studies on safety, efficacy and tolerability as per Good Clinical Practice guidelines for clinical trials in Ayurveda, Siddha and Unani medicine (GCP-ASU), 2013 and ICMR - National Ethical Guidelines For Biomedical and Health Research involving Human Participants- 2017 and other guidelines as appropriate.

Annexure 1

Additional detailed specifications for device

Sr. No.	Parameter	Description	Specifications/Limit
Details for Bottle (Note: Attach Bottle drawing for reference)			
1	Bottle dimensions	Base color of Bottle Weight of Bottle, gm Overfill capacity of Bottle, ml Bottle Height, mm Bottle Body diameter, mm Bottle Neck type Bottle Neck Bore(ID), mm Bottle Neck Outer Dia(OD), mm	Specify bottle color Specify bottle weighty Specify Specify dimension Specify dimension Screw-on/Crimp-on /Press-fit Specify dimension Specify dimension
Details for Pump and Actuator (with dust cap)			
2	Pump dimensions	Neck of Pump Material of construction of Pump Pump closure OD,mm Diptube length, mm Pump output, mcl/stroke	Specify Neck size and type Specify details of each component Specify Specify Specify
3	Pump dimensions	Gasket thickness, mm Pump and bottle fitment Strokes to prime	Specify As per approved sample Specify
4	Dimensions of Actuator & Dustcap	Actuator OD (at base), mm Actuator shoulder height, mm Total actuator+ overcap height, mm Total actuator (without overcap) height, mm Weight of actuator, gm Weight of overcap, gm Pump and Actuator Fitment	Specify Specify Specify Specify Specify Specify As per approved sample

Food Safety and Standards Authority of India (FSSAI)

FSSAI was established on 5 September 2008 under food Safety and Standards Act 2006 which consolidates various acts and order that have hitherto handled food related issues in various Ministries and Department. FSSAI has been created for laying down science based standard for articles of food and to regulate their manufacture,

storage, distribution, sale and import to ensure availability of safe and wholesome food for human consumption. FSSAI has its head quarters at New Delhi.

Structure of FSSAI

Food authority it consists of a chair person and twenty two members. The central government constitute a selection committee for the selection of chair person and members. There shall be a chief executive officer of the food authority which is to be appointed by central Government.

- Scientific Panels
  (Consists of independent scientific experts)
  Scientific committee - consists of the chair persons of scientific panels
- Central Advisory committee– It advise the food Authority on

(a) The performance of its duties under this section and in particular in drawing up of a proposal for the food Authority's work programme.
(b) On the prioritisation of work
(c) Identifying potential risks
(d) Pooling of knowledge, and
(e) Such other functions as may be specified by regulation

Functions of FSSAI

1. Framing of regulation to lay down the standard and guidelines related to food article and specifying appropriate system of enforcing various standards that notified.
2. Laying down mechanisms and guidelines for acereditation of certification bodies engaged in certification of food safety management system for food business.
3. Laying down procedure and guidelines for acereditation notification of the accredited laboratories.
4. Area which are involved in the direct and indirect bearing of food safety and nutrition FSSAI has to provide scientific advice and technical support to Government (both Central and State) in the matters of framing the policy and rules, for this area.
5. Data collection regarding food consumption, incidence and prevalence of biological risk, contaminants, residue of various contaminants, in food product and identification of emerging risk.
6. Disseminating information and promoting awareness about food safety and nutrition. Publications on safe food for different purposes have been published by FSSAI.

The pin book– It has been developed especially for kitchens in Indian homes so that the food prepared is safe, hygienic and nutritious. It deals different aspects of food in nine sections describing buying of food, food storage, preparation and cooking of food, serving food, packaging food, maintenances of hygiene and sanitation in the kitchen along with management of waste.

The orange book– The orange book guides, about safe and nutritions food at the work place, which is a nation wide campaign to help people to eat safe and eat right while at work. This book is completed into 3 parts. The first parts covers HR/ Administration in order to create a system and an enabling environment to ensure food safety and nutrition for all employee at the work place. The second part cover canteen or cafeteria for servicing safe and whole some food. Third part is concerned about employee telling dos and don'ts useful tips along with suggestions to eat and stay healthy at work place.

The purple book– This book provide general recommendation of food in disease condition like diabetes, hypertension etc. (Source-https:// www.fssai.gov.in)

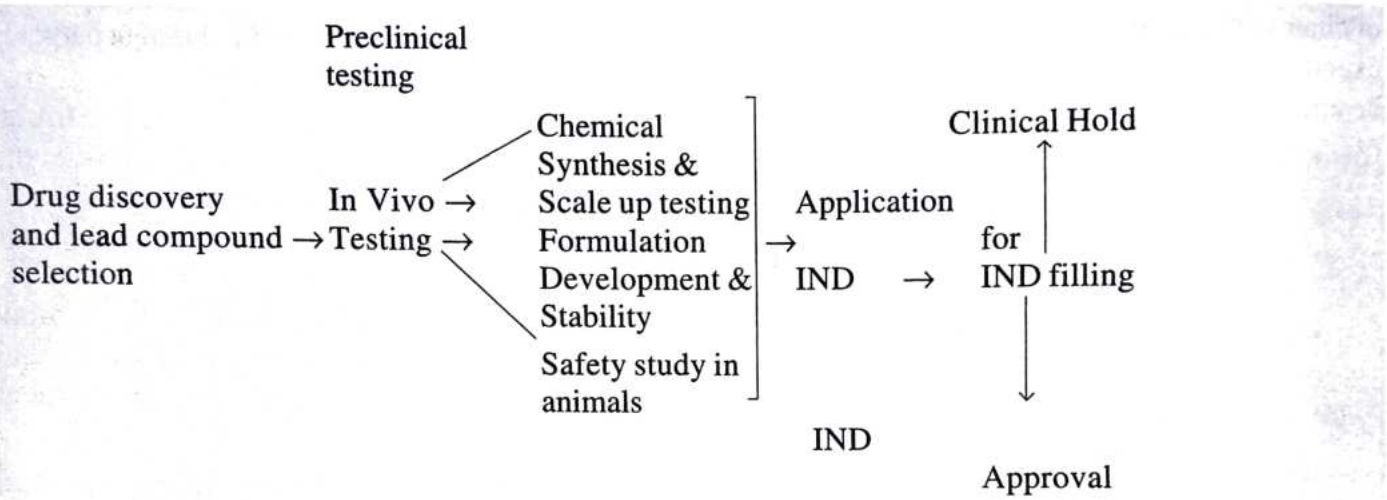
FDA Approval Drugs

FDA (Food and Drug Administration) approval of a drugs means that data on the drugs effect have been reviewed by CDER (Centre for Drug Evaluation and Research) and the drug is determined to provide benefits that out weigh its

known and potential risks for the indended population. The following steps are followed for approval of drugs–

1. Testing of during by company
2. Evidence for safety efficacy of drug send to CDER
3. Review by CDER
4. Establishing of drug's health benefits outweigh its know risk.
5. Drug is approved for sale

Its is summerised as follows :



After IND Approval clinical trial data are obtained as follows.

Phase I Study → Phase II Study → Phase III study

Filing of NDA

FDA Approval

FDA Conditional Approval

FDA Dis approval

Market → Post-Approval Safety reports to FDA

(Courtery–Remington : Essentials of Pharmaceutics, Edited by Linda Felton)

MCQs

1. Madhura drug recommended in the administration of Adraka Swarasa is
   a) Guda b) Sharkara
   c) Madhu d) Pippali
2. Therapeutic dose of Kalka according to Sharangadhara Samhita is
   a) Ardha Tola b) One Pala
   c) One Karsha d) 2 Karsha
3. Therapeutic dose of Kwatha formulation according to Sharangadhara Samhita is
   a) Two Pala b) One Pala
   c) One Karsha d) 2 Karsha
4. Therapeutic dose of Phanta formulation according to Sharangadhara Samhita is
   a) Two Pala b) One Pala
   c) One Karsha d) 2 Karsha
5. Therapeutic dose of Agnisiddha Swarasa formulation according to Sharangadhara Samhita is
   a) Two Pala b) One Pala
   c) One Karsha d) Two Karsha
6. Synonym for Kalka is
   a) Prakshepa b) Neer
   c) Mantha d) Shruta
7. To treat Kaphaja Vikara honey is mixed with Kwatha in the proportion of
   a) 1/4 of Kwatha b) 1/8 of Kwatha
   c) 1/20 of Kwatha d) 1/16 of Kwatha
8. To treat Pittaja Vikara honey is mixed with Kwatha in the proportion of
   a) 1/4 of Kwatha b) 1/8 of Kwatha
   c) 1/20 of Kwatha d) 1/16 of Kwatha
9. To treat Vataja Vikara honey is mixed with Kwatha in the proportion of
   a) 1/4 of Kwatha b) 1/8 of Kwatha
   c) 1/20 of Kwatha d) 1/16 of Kwatha
10. To treat Kaphaja Vikarasugar is mixed with Kwatha in the proportion of
    a) 1/4 of Kwatha b) 1/8 of Kwatha
    c) 1/20 of Kwatha d) 1/16 of Kwatha
11. To treat Pittaja Vikarasugar is mixed with Kwatha in the proportion of
    a) 1/4 of Kwatha b) 1/8 of Kwatha
    c) 1/20 of Kwatha d) 1/16 of Kwatha
12. To treat Vataja Vikarasugar is mixed with Kwatha in the proportion of
    a) 1/4 of Kwatha b) 1/8 of Kwatha
    c) 1/20 of Kwatha d) 1/16 of Kwatha
13. Honey is mixed with Kalka as
    a) Twice the dose of Kalka
    b) Thrice the dose of Kalka
    c) Equal that of Kalka
    d) None of these
14. The number of 'Kashaya Kalpana' according to Sushruta Samhita are
    a) 8 b) 5
    c) 7 d) 6
15. The number of 'Kashaya Kalpana' according to Charaka Samhita are
    a) 8 b) 5
    c) 7 d) 6
16. The number of 'Kashaya Kalpana' according to Kashyapa Samhita are
    a) 8 b) 5
    c) 7 d) 6
17. Synonym for Kwatha is
    a) Prakshepa b) Pinda
    c) Niryuha d) Jala
18 Drug : Water ratio for preparation of Hima is
    a) 01:04 b) 01:02
    c) 01:06 d) 01:16

19. Drug to water ratio for preparation of Tandulodaka as per Sharangadhara Samhita is
    a) 01:04 b) 01:02
    c) 01:08 d) 01:16
20. Complete the following verse अल्पस्यापप महार्थत्वं-प्रभतस्य अल्पकमथताम् । कुयाथत संयोग..... काल संस्कारयुक्तभभ।।
    a) Viyoga b) Vibhaga
    c) Vishlesha d) Vighatana
21. According to mythology Abhraka is produced from
    a) Parvati Shukra b) Vajrayudha of Indra
    c) Bramha Shukra d) All of the above
22. Synonyms of Abhraka
    a) Ambara b) Gagana
    c) Aakasha d) All of the above
23. Synonyms of Abhraka based on its structure
    a) Anantaka b) Bahupatra
    c) Both a & b d) None
24. Synonym of Abhraka based on its occurance
    a) Mleccha b) Girija
    c) Both a & b d) None
25. Synonym of Abhraka based on its Hardness
    a) Vajra b) Sphatika
    c) Kacha d) All of the above
26. According to mythology Abhraka is
    a) Artava of Parvati
    b) Rakta of Parvati
    c) Shukra dhatu of Parvati
    d) Raja of Parvati
27. Abhraka should be collected from _____ depth
    a) 1 Rajahasta b) 10 Rajahasta
    c) 2 Rajahasta d) 1/2 Rajahasta
28. Sharangadhara included Abhraka in
    a) Uparasa b) Dhatu
    c) Maharasa d) Upadhatu
29. Rasendra sara sangraha included Abhraka in
    a) Maharasa b) Sadharana rasa
    c) Uparasa d) Upadhatu
30. Abhraka is included in Maharasa by
    a) Rasaratna Samucchaya
    b) Rasaprakasha Sudhakara
    c) Rasendra Chudamani
    d) All of the above
31. One Rajahasta is equal to
    a) 22 inch b) 20 inch
    c) 21 inch d) 23 inch
32. Specific Gravity of Abhraka is
    a) 1 b) 3
    c) 2 d) 4
33. Hardness of Abhraka is
    a) 2.5 - 3 b) 3.5 - 4
    c) 3 - 3.5 d) 4 - 4.5
34. Vimunchatidalocchayam is the characteristic feature of which Abhraka
    a) Pinaka b) Manduka
    c) Naga d) Vajra
35. Which animal sound will come when Nagabhrka is heated over fire
    a) Mosquito b) Lizard
    c) Frog d) None
36. Which Abhraka will jump out when it is heated over fire
    a) Manduka c) Naga
    b) Pinaka d) Vajra
37. Malabaddhata will be produced by consuming which kind of Abhraka
    a) Vajra b) Pinaka
    c) Naga d) Manduka
38. Consumption of which Abhraka will lead to death of a person
    a) Vajra b) Pinaka
    c) Naga d) Manduka
39. Which Abhraka causes Mandala Kushta
    a) Vajra b) Pinaka
    c) Naga d) Manduka
40. Manduka Abhraka causes
    a) Ashmari
    b) Kashtasadhya Ashmari
    c) Asadhya Ashmari
    d) Shastra Asadhya Ashmari

41. Main Constituents of Alkali Tourmaline
    a) Sodium b) Lithium
    c) Potassium d) All
42. Author of Rasa Ratna samucchaya
    a) Vagbhata b) Rasa Vagbhata
    c) Vruddha Vagbhata d) None
43. Author of Ayurveda Prakasha
    a) Vagbhata b) Charaka
    c) Madhava d) Sushruta
44. Author of Rasarnava
    a) Dundhukanatha b) Both
    c) Kapalika Yogi d) None
45. Vaikranta is of how many types
    a) 7 b) Both a & b
    c) 8 d) None
46. Consumption of AshuddhaVailkranta cause
    a) Kilasa b) Pandu
    c) Parshwapeeda d) All
47. Constituents of Magnesium Tourmaline
    a) Sodium & Potassium
    b) Sodium Magnesium
    c) Alluminium & Magnesium
    d) Potassium & Magnesium
48. According to mythology, _____ is produced from Sri Krishna viddhapadatalasravitarakta
    a) Abhraka b) Makshika
    c) Vaikranta d) Shilajatu
49. Swarna Makshika, Rajata Makshika, Kansya Makshika are types of Makshika according to
    a) Rasapaddhati
    b) Rasaratnasamucchaya
    c) Rasarnava
    d) Rasa Manjar
50 Tapya is the synonym of
    a) Abhraka b) Makshika
    b) Vimala d) Rasaka
51 Makshika is available on the shores of_____ river
    a) Tapi b) Krishna
    c) Ganga d) Vaikrunti
52. The one which has madhusadrusha varna & melts like candle is the nirukti of
    a) Rasaka b) Chapala
    c) Makshika d) None
53. Dose of Vaikranta Bhasma
    a) 1/24 Ratti b) 1/12 Ratti
    c) 1/8 Ratti d) NonE
54. Dose of Makshika Bhasma
    a) 1 - 2 Ratti b) 1/2 - 2 Ratti
    c) 2 - 3 Ratti d) 1/4 - 1/2 Ratti
55. Rasaratna samucchaya described Makshika as
    a) Panchavarna suvarnavat
    b) Saptavarna suvarnavat
    c) Navavarna suvarnavat
    d) None
56. Rasa prakashasudhakara described Makshika as
    a) Panchavarna suvarnavat
    b) Saptavarna suvarnavat
    c) Navavarna suvarnavat
    d) None
57. Antidote for adverse effect of Makshika
    a) Kulattha Kwatha
    b) Dadima twak Kwatha
    c) Both a & b
    d) None
58 Ashuddha & Asmyakmarita Swarna Makshika causes
    a) Netra Vikara b) Kushta
    c) Haleemaka d) All of the above
59. Chemical formula of Swarna Makshika
    a) $Cu_2SFe_2S_3$ b) Cu_2S
    c) Fe_2S_3 d) None
60. Rasendra Chudamani was written by
    a) Somadeva b) Dundhukanatha
    c) Madhava d) Vagbhata

Answers Keys

1.	c	21	d	41	b
2.	c	22	d	42	b
3.	a	23	c	43	b
4.	a	24	c	44	c
5.	b	25	a	45	b
6.	a	26	c	46	d
7.	a	27	a	47	c
8.	b	28	d	48	b
9.	d	29	c	49	a
10.	d	30	d	50	b
11.	b	31	a	51	a
12.	a	32	b	52	c
13.	a	33	a	53	a
14.	d	34	a	54	b
15.	b	35	d	55	a
16.	c	36	a	56	c
17.	c	37	d	57	c
18.	c	38	d	58	d
19.	c	39	c	59	a
20.	c	40	d	60	c

MCQs

1. The aim of Rasa Sastra is
   a) Jivanmukti b) Deha siddhi
   c) Lohasiddhi d) None of these
2. Siddhe rase karisyami
   a) Nirgadam nischalam jagat
   b) Nirdardrya gadam jagat
   c). Nirdaridyramidam jagat
   d) Nirgadam sakalam jagat
3. "Siddhe rase karisyami nirdaridryamidam jagat" is the statement of
   a) Nagarjuna b) Vagbhata
   c) Siva d) Parvati
4. Crucible is
   a) Vankanala b) Musa
   c) Laddle d) Kosthi
5. The good characteristic feature of bhasma is
   a) Vari nimajjana b) Easily melting
   c) Rekha purana d) All of these
6. The apparatus is used for the satvapatana of abhraka is
   a) Vrintaka musa b) Gostani musa
   c) Pakva musa d) Vajra musa
7. Rekha purnata is good characterstic feature of
   a) Vati b) Bhasma
   c) Kalka d) None
8. Dipping the molten metals or minerals into liquids is known a
   a) Avapa b) Nirvapa
   c) Prativapa d) Dhalana
9. Number of types of Druti as per Rasa Sastra
   a) 2 b) 3
   c) 4 d) 5
10. Vankanala is used in Rasa Sastra for
    a) Tadana b) Dhalana
    c) Patana d) None
11. "Aratni" is a measurement of depth for puta
    a) Gaja b) Maha
    c) Kukkuta d) Varaha
12. Dipping of the red hot dhatu into liquid is known as
    a) Dhalana b) Svedana
    c) Nirvapa d) Avapa
13. Dola yantra is used for
    a) Svedana b) Patana
    c) Bijavarta d) None
14. Kacchapa yantra is used for
    a) Abhyantara Jarana b) Patana
    c) Mardana d) Bahya Jarana
15. Dravaka varga consists of
    a) Guda, gunja, ghrita, guggulu and sukha sparsha
    b) Ghrita, guggulu, guduci, guda and gunja
    c) Ghrita, guggulu, guduci, guda and sukha sparsha
    d) None of these
16. The puta having length, breadth and height of 1 yard is
    a) Kukkuta b) Vahaha
    c) Gaja d) Maha
17. Pua is an important manufacturing process of
    a) Vai b) Bhasma
    c) Pisti d) Kupipakva
18. Yantras are used to prepare
    a) Mercurial preparations
    b) Good preparations
    c) Various medicinal preparations
    d) Manufacturing of tablets
19. Water test for standard bhasma is
    a) Niscandrikarana b) Niruttha
    c) Varitara d) Rekhapurana
20. Vahnimitr is the synonym of
    a) Puta b) Musa
    c) Kosti d) None
21. Number of upalas required for kapota pua
    a) 10 b) 80
    c) 8 d) 100

22. Bhudara yantra is used for the process of
    a) Shodhana b) Mridu karana
    c) Satva patina d) Jarana
23. Pancamrittikas were mentioned in
    a) Rasaratna samuccaya
    b) Rasatarangani
    c) Rasarnava
    d) Vanga Sena
24. Damaru yantra is used mainly for
    a) Svedana b) Mardhana
    c) Urdhva patina d) None
25. Unam or uttama is the best test for the finished product of
    a) Avaleha b) Bhasma
    c) Curna d) Kvatha
26. Valuka yantra is used to prepare rasayanas
    a) Kharaliya b) Pottali
    c) Kupi pakva d) None
27. Kumudi is the synonym of
    a) Puta b) Musa
    c) Kosti d) Khalva
28. Niragni garbha yantra among the following is
    a) Damaru b) Bhudhara
    c) Valuka d) Jala kurma
29. Process to be used to remove the remianing dosas Sista dosa) of mrita loha is
    a) Lohitikarana b) Amriti karana
    c) Satva patina d) None
30. Jarana yantra is useful for
    a) Parada jarana b) Gandhaka jarana
    c) Svarna jarana d) Tamra jarana
31. Find out the synonym of saindhava lavaÚa
    a) Dud Gandhaka b) Sakmandiya
    c) Sagaraja d) Nadeya
32. Madhu, ghrita, gunja are included in
    a) Mitrapancaka b) Dravakagaka
    c) Both d) None
33. The shape of vrintaka musa is similar to
    a) Karela b) Kadaliphala
    c) Gostana d) Baingan
34. According to Rasaratna Samuccaya, varjra musa is used for
    a) Satva patina b) Nirutthi karana
    c) Amriti karana d) Marana
35. Which of the following yantra is used for Shodhana of dhatus
    a) Svedana yantra b) Palika yantra
    c) Damaru yantra d) Kacchapa yantra
36. In Rasa sala, pasana karmgs should be done in
    a) South (Daksina yamye)
    b) North (Uttara yamye)
    c) East (Purva yamye)
    d) West (Paschima yamye)
37. According to Rasaratna Samuccaya, the musa advised for liquefying kharpara satva
    a) Vrintaka b) Vajra
    c) Vajra vidravani d) None
38. The yantra is used in purification of Gauripasana
    a) Dolayantra b) Kaccapa yantra
    c) Bhudara yantra d) None of these
39. Number of vanyopalas used in mahaputa
    a) 1500 b) 1000
    c) 750 d) 500
40. In which disa vedha karma should be done in Rasa sala
    a) Purva (East) b) Uttara (North)
    c) Paschima (West) d) Daksina (South)
41. Sodhana, satva dravana hetu musa is
    a) Gostani musa b) Vrintaka musa
    c) Vajra musa d) Gara musa
42. Dhanvantari bhaga is given to Vaidya by manufacturer in the form of drug
    a) Raw material b) Money
    c) Drugs d) All
43. The use of yantras
    a) Drug manufacturing b) Parada bandhana
    c) Both of these d) None of these
44. Puta is the indicator of
    a) Heat b) Incineration
    c) Powdering d) None

45. Varitara is the test of
    a) Bhasma b) Churna
    c) Yavakuta Churna d) Avaleha
46. The liquid is used for abhiseka after loha dravikarana as per Rasaratna Samuccaya
    a) Ghrita b) Kshira
    c) Taila d) Jala
47. Tusa is used as a fuel in
    a) Maha puta b) Kapota puta
    c) Valuka puta d) Lavaka puta
48. Dola yantra is used pharmaceutically for
    a) Swedana b) Dhalana
    c) Nivapa d) None
49. Gaja puta measurements are
    a) 44x44 cm b) 55x55 cm.
    c) 57x57 cm d) None
50. Audbhida lavana is included in
    a) Pancha Lavana b) Dravaka gana
    c) Pancha sikata d) Mitrapanchaka
51. Lavana trayas is
    a) Samudra, pakya, rucaka
    b) Saindhava, pakya, rucaka
    c) Audbhida, saindhava, Samudra
    d) Pakya, audbhida, rucaka
52. Kshara traya is NIA-2005
    a) Sarji ksara, yavaksara, saubhagya
    b) Sarji ksara, tilaksara, saubhagya
    c) Apamargaksara tilaksara, saubhagya
    d) Yavaksara, tilaksara, saubhagya
53. The yantra is used to prepare hingul artificially
    a) Valuka yantra b) Garbha yantra
    c) Mridanga yantra d) Damaruyantra
54. Lohaderapunar bhavo gunadhikyam tato agranu is in the context of
    a) Sodhana b) Puta
    c) Jarana d) Murchana
55. Kimsuka, karnikara and haridradvaya are included in
    a) Shveta varga b) Pita varga
    c) Amla varga d) Visa varga
56. Kroda puta is the synonym of
    a) Varaha puta b) Lavaka puta
    c) Valuka puta d) Gaja puta
57. The fuel used in lavaka pua is
    a) Upala b) Tusa
    c) Koyala d) Wood
58. Mridu satvapatini is for
    a) Patala kosthi b) Angarakosthi
    c) Puta d) Vankanala
59. Number of upalas required for mahaputa
    a) 1500 b) 1000
    c) 500 d) 100
60. Puta is used for
    a) Preparation of Bhasma
    b) Nirvapana
    c) Shodhana
    d) All
61. Urdhvam vahni adyascapo madhye tu rasa sangraha is related to yantra as per Rasaratna Samuchchaya
    a) Garbha b) Hamsapaka
    c) Valuka d) Somanala
62. Which of the following is prepared from mandura, guda by giving bhavana with babbula Swarasa
    a) Tara mandora b) Gudamandura
    c) Hamsa mandŕa d) Jala mritsna
63. The pit measurement are 2x2x2 hasta pramana in case of
    a) Mahaputa b) Gajaputa
    c) Varahaputa d) Kapota puta
64. In the preparation of kupipakva rasayanas the kupimudrana is done after
    a) Melting of drugs
    b) Suppression of flames
    c) Jarana of Gandhaka
    d) Suppression of fumes
65. Khajjali when mixed and grinded with liquid dravyas is known as
    a) Rasa Pushpa b) Rasa Panaka
    c) Rasa Parpati d) Rasa Pisti

66. The yantra used to prepare rasa Sindura
    a) Swedana yantra b) Dola yantra
    c) Kaccapa yantra d) Valuka yantra
67. Patana is used in the samskara of
    a) Parada b) Svarna
    c) Abhraka d) Gandhaka
68. Which of the following is true in case of Parada doshas
    a) Naisargika doshas are 3
    b) Yogika doshas are 2
    c) Aupadika doshas are 7
    d) All of these
69. Which one of the following is useful in mercury poisoning
    a) Shilajatu b) Karpura
    c) Hingula d) Abhraka
70. The Dravya has six rasas
    a) Paradarasa b) Shilajatu
    c) Loha d) Abhraka
71. Number of rasapujas as per Rasa Vagbhata
    a) 4 b) 5
    c) 8 d) 18
72. Number of kancuka doshas of parada
    a) 6 b) 7
    c) 8 d) 10
73. What is the number given to jaluka bandhana of parada as per Rasa Vagbhata
    a) 10 b) 20
    c) 25 d) 26
74. Dhvankshi is a type of dosa
    a) Dhatu b) Parada
    c) Gandhaka d) Loha
75. The dosa removed with triphala kvatha by parada murchana as per Rasa Vagbhata
    a) Mala b) Vahni
    c) Visha d) Naga
76. Which dosha is eliminated by murchana samskara of parada
    a) Naga-Vanga b) Naisargika
    c) Bhedi d) Andhakari
77. Total number of rasa samskaras as per Rasa Hridaya Tantra
    a) 8 b) 18
    c) 25 d) 5
78. The dosha will be removed by Parada Swedana in Triphala Kwatha
    a) Visa b) Agni
    c) Mala d) None
79. Proportionate ratio of parada and gandhaka in Hgs compounds i
    a) 6:1 b) 1:6
    c) 1:1 d) 1:3
80. Dosha Saithilyakaraka of parada is due to samskara
    a) Svedana b) Murchana
    c) Mardhana d) Niyamana
81. The minimum quantity of Parada to be token for the purification purpose
    a) 1 pala b) 2 pala
    c) Half pala d) 3 pala
82. HgS Sulphie of mercury) is
    a) Raa karpura b) Rasamanikya rasa
    c) Rasa sindura d) Rasa pushpa
83. SO, is released during the preparation of
    a) Khajjali
    b) Rasamanikya rasa
    c) Rasasindura
    d) Ananda bhairava rasa
84. Nirgandhaka murchana is found with
    a) Mudga rasa b) Rasa Parpati
    c) Makharadhvaja d) Rasa sindŕa
85. Mercury Parada is obtained from
    a) Hingula b) Talaka
    c) Mandura d) Manahsl̥la
86. Which of the following is not rasa samskara
    a) Patana b) Murchana
    c) Both d) Stambhana
87. The specific gravity of parada is
    a) 10.6 b) 13.6
    c) 12.6 d) 11.6

88. The naivedyam of parada is
a) Abhraka b) Maksika
c) Gandhaka d) Rasakas

89. The samskara involved in sandatva nivarana of parada is
a) Rodhana b) Utthapana
c) Patana d) Niyamana

90. Vyadhi ghatakatva kara property of parada is achieved by
a) Jarana b) Shodhana
c) Murchana d) Dalhana

91. Parpai bandhana of parada is included in bandhana
a) Khota b) Arota
c) Pisti d) Pota

92. The process involved in parada mercury) obtained from hingula is
a) Distillation b) Sublimation
c) Extraction d) None

93. The symbol of parada is B.H.U.-1993
a) Ag b) Hg
c) Pb d) Au

94. Bida lavana is used for the process of
a) Rasa jarana b) Rasa Dipana
c) Rasa Shodhana d) None of these

95. Find out 'calomel' in the following:
a) Hgs b) HgCl,
c) Hg_2Cl_2 d) Hg_2Cl

96. Pancama parada samskara is
a) Svedana b) Murchana
c) Patana d) Uttapana

97. Which is known as sutendra virya prada
a) Parada b) Capala
c) Rasaka d) Gandhaka

98. The samskara is responsible for capalatva nivritti of parada
a) Murchana b) Niyamana
c) Svedana d) Bandhana

99. Parada attains rujahara property after which samskara
a) Murchana b) Swedana
c) Mardana d) Utthapana

100. Evaporation temperature of HgS is sindura
a) 400 ^{0}C b) 500 ^{0}C
c) 600 ^{0}C d) 650 ^{0}C

101. The percentage of mercury present in gin
a) 20% b) 40%
c) 60% d) Nil

102. Number of yaugika dosas of parada
a) 2 b) 5
c) 7 d) 4

103. Number of types of parada mercury as per Rasa Ratna Samuccaya
a) 4 b) 2
c) 3 d) 5

104. Number of parada gaties are
a) 2 b) 4
c) 5 d) 8

105. Mineral of parada is
a) Hingula b) Hematite
c) Azurite d) All

106. Find out "Grey powder" in the following
a) Kajjali b) Rasa karpora
c) Mugdha rasa d) Rasa puspa

107. Rasa kusuma is also known as Tri-2000
a) Rasa sindura b) Rasa panka
c) Rasa karpora d) None

108. According to Rasa Tarangini, the dose of rasa karpura is
a) 1/64-1/32 ratti (2-4 mg)
b) 1/2 ratti (62 mg)
c) 1-2 ratti (125-250 mg)
d) 1/4-1/2 ratti (30-60 mg)

109. Ingredients required to prepare rasa parpai
a) Parada and Gandhaka
b) Gandhaka and Abhraka
c) Svarna and rajata
d) Nasasadara and surya kshara

110. Rasa karpura is used in treatment of
a) Phiranga roga b) Yoniroga
c) Pakssaghata d) Arshas

111. Rasa karpura is prepared with
a) Sodhita parada b) Gandha kamla
c) Saindhava lavana d) All

112. Sadguna balijarita rasa sindura is prepared from
a) Sodhita parada b) Sodhita gandhaka
c) Both d) Girisindura

113. Parada attains Rasayana property after consuming
a) Suvarna
b) Gandhaka and Abhraka
c) Suvarna and Gandhaka
d) Abhraka and svarna

114. Panchamrita parpai is mainly indicated in
a) Prameha b) Jvara
c) Visarpa d) Grahani

115. The parpai which has no taste and smell is
a) Tamra parpai b) Vijaya Parpati
c) Sudha parpai d) Svarna parpai

116. How many number of samskaras are essentially required to parada for the medicinal purposes dehavada)
a) 3 b) 18
c) 5 d) 4

117. Svarupapadana is attained to parada mercury) due to samskara
a) Murchana b) Bodhana
c) Niyamana d) Utthapana

118. The rasa bandha which is done with sodhita (purified) parada is known as
a) Arota b) Khota
c) Kriya hina d) None

119. Misraka is the type of
a) Naga b) Yasada
d) Rajata c) Parada

120. The rasausadhi is used in grahaÚi roga
a) Rasa sindura b) Rasa kapura
c) Rasa parpai d) Malla sindura

121. Rasa sinduram is included in ———— ——rasayanas
a) Bandhita b) Kupipakva
c) Khalviya d) Pottali

122. One of the constituents of makara dhvaja is
a) Marakata b) Svarna
c) Rajata d) Tamra

123. Rasa karpuram is included in.....rasayana
a) Bandhita b) Khalviya
c) Kupipakva d) Pottali

124. The quantity of gandhaka in gandhaka jarana is
a) 16 parts b) 1/6 part
c) 36 parts d) 34 parts

125. Rasa parpai is specially indicated in
a) Jvara b) Grahani
c) Amlapitta d) None

126. The quantity of gold swarna) used to prepare siddha makaradhwaja is
a) 1 part b) 2 parts
c) 4 parts d) 8 parts

127. Ingredients of kajjali are parada and
a) Vanga b) Naga
c) Gandhaka d) Abhraka

128. Rasa (parada) as such is prescribed to take internally or in severe pain in
a) Bhaisajya Ratnavali
b) Siddha Bhesajamani Mala
c) Yogaratnakaram
d) None

129. One of the following is used to prepare rasa pushpa
a) Puspa kasisa b) Puspanjana
c) Yasada puspa d) Hingula

130. The natural ore of mercury is Tn-
a) Galena b) Cinnabar
c) Litharge d) None

131. Kupipakva rasayana preparation among the following
a) Rasamanikya b) Kajjali
c) Rasa Parpati d) Makaradhwaja

132. Rasa parpai was introduced for the first time in kalpa form by
a) Sivadas Sen
b) Gananath Sen
c) Cakrapani Datta
d) Kaviraj Gandhara Sen

133. Visha dosha of parada can be detoxicated by
a) Lasuna b) Triphala
c) Kumari d) Citraka

134. Find out the samskara of the parada
a) Andhakari b) Patini
c) Gagana bhaksana d) All

135. Nastapistatva state of parada is due to
a) Bahyadruti b) Garbhadruti
c) Murcchana d) Mardana

136. Type of rasa parpai is advised in therapeutics
a) Mridupaka b) Madhyamapaka
c) Kharapaka d) Dagdhapaka

137. Type of rasa parpai is flexible
a) Mridupaka b) Madhyamapaka
c) Kharapaka d) None of these

138. Suta Shekhara rasa is mainly indicated in
a) Grahani b) Kustha
c) Amlapitta d) Navajvara

139. Hema garbha pottali rasa is mainly indicated in
a) Pandu b) Hridroga
c) Pakshaghata d) Grahani

140. Malla Sindura contains one of the following
a) Lead b) Arsenic
c) Gold d) None of these

141. Kupi will be used in the preparation of
a) Laxmi vilasa rasa
b) Samirapannaga rasa
c) Ananda bhairava rasa
d) Yogendra rasa

142. The rasausadhi which is indicated in Pratishyaya
a) Ananda bhairava rasa
b) Mrityunjaya rasa
c) Laxmi vilasa rasa
d) Sitamsu rasa

143. To prepare good quality of swarna vanga the quantity of parada should be
a) Equal b) Double
c) Triple d) None

144. The main ingredient present in hridyarnava rasa is....
a) Swarna b) Rajata
c) Tamra d) Lauha

145. Candra kala rasa is useful especially in
a) Pradara b) Pandu
c) Jwara d) Amlapitta

146. Vasanta kusumakara rasa is specially useful in
a) Madhumeha b) Arshas
c) Ashmari d) Stanarbuda

147. Karpura rasa is a type of
a) Parpati b) Kajjali
c) Kupipakva Rasayanad) Khaliviya Rasayana

148. Bola parpai is indicated in
a) Grahani b) Atisara
c) Raktapitta d) Arshas

149. The main active ingredient of suchika bharana rasa (Rasendra Sara Sangraha) is
a) Swarna b) Sarpavisa
c) Bhallataka d) Kupilu

150. The parpai is not used in grahaÚi roga
a) Rasa parpati b) Swarna Parpati
c) Panchamrita Parpati d) Shveta parpati

151. Shwasa kuthara rasa is indicated in
a) Kasa and Shwasa b) Arsha
c) Jvara and Raktapitta d) Ksaya

152. Number of drishya gaties of parada
a) 5 b) 4
c) 10 d) 3

153. Number of types of parada based on kīetra bheda
a) 8 b) 7
c) 10 d) 5

154. Number of parada bandhanas are as per Rasaratna Samuccaya
a) 25 b) 26
c) 24 d) 28

155. Trisuta as per Rasaratna Samuccaya
a) Parada, gandhaka and Manashila
b) Gandhaka, haratala and Manashila
c) Parada, haratala and Manashila
d) Parada, misraka and suta

156. Ingredients for the preparation of svarna vanga
a) Svarna, vanga, kalmisora
b) Svarna, parada, vanga
c) Vanga, kalmisora, Navasadara
d) Kajjali, vanga, Navasadara

157. Mugdha rasa is included in yogas murchana
a) Sagandha saagni b) Sagandha niragni
c) Nirgandha saagni d) Nirgandha niragni

158. Kancuki Dosha of parada among below is
a) Naga b) Vanga
c) Parpati d) Asahyagni

159. The process involved in niyamana samskara of parada is
a) Mardana b) Swedana
c) Patana d) None

160. Parpai is a type of parada dosa included in
a) Saptakancuka doshas
b) Naisargika doshas
c) Aupadika doshas
d) None of these

161. Naisargika doshas of parada are
a) Visha, vahni and mala
b) Naga, vanga and yasada
c) Rajata, Tamra and loha
d) Parpai, patini and bhedini

162. Patra (leaf) is used in the preparation of rasaparpati
a) Eranda patra b) Kutaja patra
c) Kadali patra d) All of these

163. Find out talastha kupipakva rasgyana preparation in the following
a) Rasa pushpa b) Rasa karpura
c) Samirapannaga rasa d) None of these

164. Iksu rasa is a bhavana dravya used in the preparation of
a) Vasanta kusumakara rasa
b) Vasanta malati rasa
c) Maha laxmi vilasa rasa
d) Naradiya laxmi vilasa rasa

165. Nari stanyam (stri dugdham) is used to prepare
a) Kapha ketu rasa
b) Sanjivani vati
c) Pancamrita Parpati
d) None

166. The material used to prepare flat form for the preparation of parpatt
a) Gomaya b) Mahisa mala
c) Panka d) All

167. Misrakam is a
a) Synonym of parada b) Type of parada
c) Type of vanga d) All of these

168. The ratio of vanga, parada, gandhaka and navasadara used to prepare svarÚa vanga
a) 11:11 b) 1:2:1:2
c) 1:1/2-1:1 d) None

169. The ratio of svarna, Parada and gandhaka used to prepare makara dhvaja
a) 1:8:16 b) 2:4:16
c) 1:4:16 d) None of these

170. Which of the following is true in case of parada doshas
a) Naisargika doshs are 3
b) Yogika doshas are 2
c) Kancuka doshas are 7
d) All of these

171. The ingredient present in Tamra parpai
a) Kucala b) Bhallataka
c) Vatsanabha d) Citrakamula

172. The quantity of svarna is used to prepare svarna vanga
a) 1 part b) 2 parts
c) 3 parts d) Nil

173. Aupadika doshs of parada are
a) Mala b) Visa
c) Avarana d) Kancuka

174. The disease caused by parada due to bhumija dosha
a) Kustha b) Bhrama
c) Vrana d) Vitsanga

175. Parada is contra indicated in
a) Kustha b) Prameha
c) Burns d) None

176. Number of parada samskaras is required for making drugs for internal use
a) 5 b) 8
c) 4 d) 6

177. According to Rasaratna Samuccaya, rasa is the best due to its
a) Easily availability b) Ajara, amara gunas
c) Rasayana property d) B & C above

178. The indication of rasa parpai
a) Grahani b) Pandu
c) Kamala d) Jvara

179. The colour of Rasendra as per Rasaratna Samuccaya is
a) Syava b) Rakta
c) Pita d) Shweta

180. Which of the following is classified into five types on the basis of kshetra Bheda
a) Hingula b) Parada
c) Gandhaka d) Makshika

181. Which of the following is said to be useful in escaping bramha hatya pataka
a) Parada Shodhana
b) Parada bandhaka
c) Rasa siddhi
d) Cure of paralytic disease

182. According to law of definite proportion of conjugation the ratio of parada and gandhaka in their Samyoga
a) 1:4 b) 1:8
c) 1:6 d) 6:1

183. Parada malinya is due to
a) Rudra b) Bramha
c) Indra d) None

184. Nasta pistatva of parada is due to samskara
a) Svedana b) Mardana
c) Murchana d) Utthapana

185. Find out mukti prada parada in the following?
a) Baddha b) Murchita
c) Marita d) Jarita

186. Method of extraction of parada from hingula is
a) Sublimation b) Extraction
c) Distillation d) Fermentation

187. Number of kancuki Doshas of parada
a) 6 b) 7
c) 9 d) 10

188. Anuvasana samskara was added to parada by
a) Dundhuka Nath
b) Rasa Vagbhata
c) Krisna Gopala Bhatt
d) Kaviraj Pratap Singh

189. The following is considered as naivedya of parada
a) Vanga b) Maksika
c) Gandhaka d) Abhraka

190. Atomic weight of mercury is
a) 100.6 c) 300.6
b) 200.6 d) 400.6

191. All sadrasas are present in
a) Parada b) Vajra
c) Vaikranta d) All

192. Parpati belongs to bandha
a) Pota b) Pottali
c) Arota d) Abhasa

193. Number of rasa siddhas are
a) 36 b) 46
c) 56 d) 64

194. According to Bhava Prakasha, rasa karpura is specially used in
a) Visama jvara b) Prameha
c) Puyameha d) Phiranga roga

195. Affinity of mercury is maximum towards
a) Sulphur b) Borax
c) Zypsum d) Rock salt

196. The description of jivanmukti (moksa prapti) through parada is described in
a) Rasesvara darshana
b) Yajna valkya Samhita
c) Goraksa Samhita
d) Rasarnava

197. Commonest ore of mercury is
a) Cinnebar b) Meta cinnabar
c) Hematite d) Lepidolite

198. The effect of dipana samskara of parada is
a) Capalatva nivritti
b) Murccha vyapathi nasana
c) Grasarthi
d) Bahirmala vinasa

199. The ratio of parada and saindhava lavaÚa used to prepare rasa karpura
a) 1:2 b) 1:3
c) 1:1 d) 1:4

200. The property of Makara Dhvaja is
a) Medhya Rasayana b) Mutrala
c) Vajikarana d) Asmarighna

201. Ingredients of mugdha rasa
a) Gandhaka, Parada
b) Gandhaka, khatika
c) Gandhaka, parada, khatika
d) Parada, khatika

202. Ingredients of panchamita parpati
a) Parada gandhaka vajrabhraka tamra and kanta loha Bhasma
b) Hingula, gandhaka, raupya, mukta and tamra
c) Parada, gandhaka, raupya, tamra and tiksna loha
d) None of these

203. Sindura kalpas are included in .....rasayanas
a) Kharaliya b) Kupipakva
c) Pottali d) None

204. Naga vanga dosas of parada are
a) Aupadika b) Naisargika
c) Kancuka d) None

205. "Yena yena hi cancalyam durgrahatvam ca nasyati in case of parada is due to
a) Niyamana samskara b) Bodhana samskara
c) Parada bandhana d) Dipana samskara

206. Which of the following is not pgrada samsakra
a) Rodhana b) Niyamana
c) Ranjana d) Gagana bhaksana

207. Maladosa of parada is eliminated by per Rasa Tarangini
a) Triphala b) Citraka
c) Aragvadha phala majjad) Grihadhuma

208. "Kharantu visavat tyajet" is in the context of
a) Rasa karpura b) Rasa sindura
c) Rasa parpati d) Rasa puspa

209. Pathya during parada sevana
a) Tanduliya, patola
b) Kakarastaka
c) Bilva, kusmanda
d) Langana, udgharsana

210. Rasa karpura is indicated in
a) Upadamsa b) Usnavata
c) Phiranga roga d) Paksma kopa

211. At what temperature cinnebar is converted to mercury
a) 500 k b) 600 k
c) 800 k d) 1200 k

212. Dvanksi is one of the types of parada dosha
a) Naisargika b) Aupadika
c) Kancuka d) None

213. Dravana samskara of parada is described in
a) Rasarnava
b) Rasendra Cudamani
c) Rasaratna Samuccaya
d) Rasa Tarangini

214. Bahirmala vinasana is due to which samskara of parada
a) Svedana b) Mardana
c) Murchana d) Patana

215. Murccha vyapathi nasana is due to samskara of parada
a) Patana b) Utthapana
c) Niyamana d) Dipana

216. Arogya vardhini vai is included in rasayanas
a) Kharaliya b) Kupipakva
c) Pottali d) None

217. Niyamana is number of parada samskara
a) 7^{th} b) 6^{th}
c) 5^{th} d) 8^{th}

218. Galananka of parada is
a) -35.8°C b) 35.8°C
c) -36°C d) 35.7°C

219. What is bija UA-2006
a) Raupya b) Abhraka
c) Parada d) Tamra

220. Talastha kupi pakva rasayana is
a) Rasa sindura
b) Samira pannaga rasa
c) Rasa karpura
d) Malla sindura

221. Naga vanga parimuktah samutthitah kanjika kvathata R.H. Tantra) is meant for which samskara
a) Mardana b) Murcchana
c) Utthapana d) Patana

222. Divya Shukra is the synonym of
a) Parada b) Abhraka
c) Gandhaka d) Kasisa

223. Which of the following is "Prano Rasendrasya"
a) Abhraka b) Makshika
c) Vimala d) Shilajatu

224. Number of maharasas are
a) 4 b) 6
c) 8 d) 10

225. Fin out "copper pyrite" in the following
a) Abhraka b) Kasisa
c) Svarna makshika d) Gandhaka

226. Mutragandha is the specific feature of
a) Gandhaka b) Parada
c) Shilajatu d) Abhraka

227. "Biotite" is the chemical name of
a) Mercury b) White mica
c) Black mica d) Silver

228. According to Rasa Ratna Samuccaya, the Shilajatu is purified with
a) Dashamula kwatha b) Bhringaraja svarasa
c) Triphala kvath d) B and C above

229. Abhraka comes under among the below
a) Mahrasa b) Uparasa
c) Sadharana rasa d) None

230. The type of abhraka expands puffing) on heating
a) Naga b) Vajra
c) Pinaka d) Manduka

231. Sahasraputi abhraka bhasma is indicated in
a) Jvara b) Brimhana
c) Vajikarana d) Rasayana

232. The satva of svarna makshiika is
a) Iron b) Copper
c) Aluminium d) Gold

233. The rasa which is available at a depth of one raja hasta is
a) Abhraka b) Vaikranta
c) Makshika d) Vimala

234. The source of tourmaline is
a) Stone b) Plant
c) Leaves d) Anima

235. Madhu dhatu is the synonym of
a) Vimala b) Manikya
c) Makshika d) Vaikranta

236. Sikhigriva is the synonym of
a) Sasyakam b) Sphatika
c) Kasisa d) Loha

237. The colour of prasastha sasyaka is
a) Blue b) Black
c) White d) Yellow

238. The rasa obtainable in madhavi masa is as per Rasa Ratna Samuchchaya
a) Abhraka c) Shilajatu
b) Maksika d) Hingula

239. Number of types of Vaikranta as per Rasa Ratna Samuccaya are
a) 2 b)3
c) 4 d)8

240. Tapija is the synonym of
a) Vimala b) Abhraka
c) Makshika d) Shilajatu

241. The type of abhraka causes vitsanga and marana
a) Pinaka b) Naga
c) Maduka d) Vajra

242. The following type of abhraka causes mandala Kustha
a) Pinaka b) Naga
c) Manduka d) Vajra

243. According to Ayurveda Prakasa, the characters niskona, guru, ghrita makara kalima are the identifying features of
a) Shilajatu b) Makshika
c) Vimala d) Abhraka

244. Astasra, asta phalaka and satkona are the features of
a) Abhraka b) Vaikranta
c) Makshika d) Vimala

245. Find out the false in cases of Shilajatu
a) Member of maha rasas
b) Prameha Aushadhi
c) It is known as bitumen
d) None of these

246. The type of mica is known as biotite
a) white mica b) Black mica
c) Red mica d) Yellow mica

247. "Adrija" is the synonym of
a) Shilajatu b) Tuttha
c) Gairika d) Giri Sindura

248. Pure Shilajatu is used as a remedy for
a) Mutravaha srotas
b) Nadivaha sansthana
c) Svasavaha sansthana
d) Pachana sansthana

249. Which of the following is ferro-magnicium mica
a) Svetabhraka b) Krisnabhraka
c) Raktabhraka d) B & C

250. Find out the corrosive material among the following
a) Sulphur b) Orchre
c) $CuSO_4 5H_2O$ d) Alum

251. Nirdhuma is the suitable test for
a) Parada b) Haratala
c) Shilajatu d) None

252. Shilajatu belongs to which of the following groups
a) Animal b) Vegetable
c) Synthetic d) Mineral

253. Shilajatu is best indicated in
a) Jvara b) Atisara
c) Prameha d) Kustha

254. According to Rasendra Sarasangraha the ratio of abhraka and dhanya should be used in dhanyabhraka process
a) 1:1/4 b) 2:3
c) 1:1 d) 4:1

255. The process of lohitikarana (transforming into raktotpala sama prabha) is described for Bhasma
a) Tamra b) Abhraka
c) Talaka d) None

256. Abhraka bhasma is to presence of.... useful in heart diseases due
a) Magnesium b) Copper
c) Iron d) Aluminium

257. According to Ayurveda Prakasa, "mrityu kru vyaghra romavat" is due to sacandra Bhasma
a) Abhraka b) Makshika
c) Tamra d) None

258. Red coloured bhasma among the following is
a) Rajata b) Tamra
c) Mukta d) Abhraka

259. The special test for abhraka bhasma is
a) Rekhapuranatva b) Varitara
c) Nischandrl karana d) None of these

260. The following is contraindicated during Shilajatu therapy
a) Kulattha b) Laksha
c) Draksha d) Dadima

261. Vyoma is the synonym of
a) Abhraka b) Makshika
c) Vaikranta d) Rasaka

262. Find out "Gagana" in the following
a) Abhraka b) Gandhaka
c) Parada d) Svarna

263. The type of Krishna Abhraka is used in Bhasma preparation
a) Naga b) Pinaka
c) Manduka d) Vajra

264. Savarna Makshika is the ore of
a) Copper b) Silver
c) Iron d) Gold

265. The following may take the shape of a snake when it is placed on fire
a) Nagabhraka b) Pinakabhraka
c) Capala d) Rasaka

266. Number of types of Shilajatu as per Rasa Classics
a) 2 b) 4
c) d) 10

267. Shilajatu is used for
a) Rasayana b) Karsana
c) Visaghna d) Kandughna

268. Number of types of Shilajatu as per Charaka
a) 2 b) 4
c) 6 d) None

269. Number of types of Shilajatu as per Sushruta
a) 2 b) 4
c) 6 d) 8

270. Suka piccha is the type of
a) Parada b) Gandhaka
c) Hingula d) Vajra

271. Kunati is the synonym of
a) Haratala b) Manashila
c) Gandhaka d) Makshika

272. According to Rasa Karma Dhenu, the Dravya Lelitaka means
a) Parada b) Gandhaka
c) Loha d) Mandura

273. Syamangi is the variety of
a) Talaka b) Manashila
c) Kasisa d) Loha

274. Chemically realgar (Manashila) is a compound of
a) Red arsenic b) White arsenic
c) Yellow arsenic d) None of these

275. Khaga is the synonym of
a) Abhraka b) Rasaka
c) Kasisa d) Capala

276. Find out yellow orpiment in the following
a) Haratala b) Malla
c) Manashila d) Gauripasana

277. "Girija puspa" is the synonym of
a) Parada b) Gandhaka
c) Abhraka d) Darada

278. Number of types of Gandhaka based on Varna as per Rasaratna Samuchchaya
a) 3 b) 2
c) 4 d) 5

279. Haratala is compound of .....and sulphur
a) Mercury b) Iron
c) Arsenic d) Lead

280. Sphatika is mainly indicated as per Rasaratna Samuchchaya in
a) Kasa b) Jvara
c) Kustha d) Pandu

281. Mayura kantha Samuchchaya is attributed to
a) Kasisa b) Tuttha
c) Nilam d) Pravalam

282. ASS, is the symbol of
a) Haratala b) Manashila
c) Gauripasana d) Mala

283. Find out the copper sulphate in the following
a) Sasyaka b) Kasisa
c) Makshika d) Vimala

284. Purification with goghrita and goksira is done in
a) Gandhaka b) Makshika
c) Kasisa d) Gairika

285. The uparasa is used to prepare rasamanikya rasa
a) Haratala b) Manashila
c) Parada d) Manikya

286. Melting point of gandhaka (sulphur) is
a) 92^0C b) 112.8^0C
c) 33^0C d) 172^0C

287. Gandhaka is included in per Rasaratna Samuchchaya groups as
a) Maharasa b) Uparasa
c) Sadharana rasa d) Uparatna

288. The purification of kasisa can be done by bhavana impregnation) for
a) 3 days in jambira svarasa
b) 5 days in nimba patra svarasa
c) 1 day in bhringaraja svarasa
d) 2 days in vasapatra svarasa

289. Sphatika is classified under..... Group
a) Ratna b) Uparasa
c) Maharasa d) Uparatna

290. The valancy of sulphur is
a) 2 b) 4
c) 8 d) None

291. Number of uparasas mentioned in Rasaratna Samuchchaya
a) 7 b) 8
c) 6 d) 5

292. Suddha gandhaka is not advised in vikara
a) Pitta b) Kapha
c) Vata d) None

293. Bali is the synonym of
a) Gandhaka b) Sasyaka
c) Mashika d) Abhraka

294. Ferrous sulphate is the chemical name of
a) Gairika b) Gandhaka
c) Kasisa d) Kanksi

295. Number of types of anjanas mentioned in Rasaratna Samuchchaya
a) 4 b) 5
c) 6 d) 7

296. Gandhaka Shodhana dravya as per Rasaratna Samuchchaya is
a) Goghrita b) Gokshira
c) Both d) Madiphala

297. Nirjalikarana process is adopted for the Shodhana of
a) Navasadara b) Kanksi Alum)
c) Sasyaka d) Shilajatu

298. Manashila is a compound of
a) Iron b) Copper
c) Arsenic d) None

299. Iron is available in
a) Gairika b) Hiraka
c) Kanksi d) Haratala

300. Anti scabis drug among the following is
a) Narikela jala b) Manjista
c) Pippali churna d) Sulphur

301. According to Rasa Vagbhata, the purification of Haratala is done by Swarasa
a) Kusmanda b) Karavellaka
c) Kadali patra d) None

302. The process involved in shodhana of Anjana
a) Dhalana b) Svedana
c) Niyamana d) Bhavana

303. Which one of the following is included in uparasa group
a) Kankusta b) Vahnijara
c) Kapardika d) Kampillaka

304. The extraction of zinc from rasaka was first mentioned in
a) Rasaratna Samuchchaya
b) Rasendra Sara Sangraha
c) Rasa Ratnakara
d) Rasa Prakasa Sudhakara

305. The drug having "Stripuspa haranam" property
a) Kapardika b) Pinda talaka
c) Gauripashana d) Kamkustha

306. Rakta curnaka is the synonym of
a) Kapardika b) Kampillaka
c) Gauripashana d) Kamkustha

307. Sukatunda is one of the types of
a) Hingula b) Gandhaka
c) Gauripasana d) Mriddarashringa

308. The origin of Kampillaka
a) Animal b) Herbal
c) Mineral d) None

309. Hamsapada is one of the types of
a) Darada b) Gandhaka
c) Parada d) Rasaka

310. The pharmacological property of kampillaka is
a) Recaka b) Stambhaka
c) Kusthaghna d) Jvaraghna

311. The process involved in the purification of hata curnaka
a) Mardana b) Swedana
c) Patana d) Murchana

312. In Rasa Sastra litharge is known as
a) Giri sindura b) Mriddarashringa
c) Navasadara d) None

313. Find out the red oxide of mercuy in the following?
a) Giri sindura b) Mriddarashringa
c) Karpara d) Kankusta

314. The chemical composition of Mriddarashringa is
a) Hydrogen + Oxygen
b) Lead + Oxygen
c) Tin + Oxygen
d) Zinc + Oxygen

315. Kampillaka comes under Rasa Vagbhata group as per
a) Maharasa b) Uparasa
c) Sadharana rasa d) None

316. Kankusta comes under.....group
a) Ras b) Maharasa
c) Uparasa d) Sadharana rasa

317. The symbol of litharge is
a) PbO b) PbS
c) ZnS d) HgO

318. White arsenic among the following is
a) Arsenic sulphide b) Arsenic oxide
c) Pure arsenic d) None

319. Atomic weight of arsenic is
a) 200.6 b) 196.97
c) 107.88 d) 74.91

320. Gauripashana is chemically ——— oxide
a) Lead b) Mercury
c) Arsenic d) Zinc

321. Number of sadharana rasas as per Rasaratna Samuchchaya
a) 4 b) 6
c) 8 d) 10

322. Varatika is originated from
a) Parthiva b) Bhauma
c) Jangama d) Udbijja

323. Find out "sadharana rasa" in the following
a) Maksika b) Vaikranta
c) Gandhaka d) Gouripashana

324. Ammonium chloride is the chemical name of
a) Khatika b) Tankana
c) Navasadara d) Subhra

325. Tuvari is a synonym of
a) Sphatika b) Tankana
c) Tavaksiri d) Vikranta

326. Agnijara is
a) Pathiva b) Vanaspatika
c) Jangma d) Sudhavarga

327. Find out the controversial drug in the following?
a) Kharpara b) Gouripashana
c) Kaparda d) Capala

328. Kapardika bhasma is used for
a) Amla pitta b) Udara
c) Raktapitta d) Arshas

329. The drug does not need úodhana and marana for therapeutics
a) Capala b) Pravala
c) Parada d) Agnijara

330. Agnijara is purified with
a) Bhavana with Snuhi Kwatha
b) Swedana in kanjika
c) Nirvapa in Gomutra
d) None of these

331. Varatika (kapardika) is classified on the basis of its
a) Shape b) Source
c) Weight d) Colour

332. The sadharana rasa which is used for jarana of parada and dravana of lohas
a) Mriddarashringa b) Nava sadara
c) Giri sindura d) Kanksi

333. Girisindura contains among the following
a) Mercury b) Lead
c) Iron d) Copper

334. Vaikranta is included in
a) Maha rasas b) Uparatnas
c) Both d) Uparasa

335. Number of varieties of vaikranta as per Rasendra Cudamani
a) 6 b) 4
c) 7 d) 5

336. Rasamanikya rasa is indicated in
a) Pandu b) Kustha
c) Phiranga roga d) Pakshghata

337. Vaikranta bhasma is a content of
a) Brihat vata cintamani rasa
b) Sutashekhara rasa
c) Mahavata vidhvamsini rasa
d) Ratnagiri rasa

338. Find out "Indian salt petre" in the following?
a) Surya ksara b) Nava sadara
c) Tuttha d) Tankana

339. "Fools gold" is the English name of
a) Svarna makshika b) Svarna vanga
c) Svarna Shilajatu d) None

340. Name of the parpai which does not contains parada and gandhaka
a) Tamra Parpati b) Shveta Parpati
c) Viajaya Parpati d) Rasa Parpati

341. The bhasma found as one of the ingredients in rajah pravartini vai is
a) Abhraka bhasma b) Kasisa bhasma
c) Loha bhasma d) Tamra bhasma

342. The parpai preparation is indicated in mutrakricchra
a) Rasa Parpati b) Shveta Parpati
c) Loha Parpati d) Abhra Parpati

343. The sadharana rasa derived from the plant is
a) Manashila b) Haratala
c) Kampillaka d) Agnijara

344. The quality of grasa abhraka is
a) Shining b) Non-shining
c) White d) Black

345. The pharmacological action of malla
a) Vata pitta shamaka
b) Vata kapha shamaka
c) Kapha pitta shamaka
d) Pitta shamaka

346. Sodhana dravya of makshika is
a) Triphala kwatha b) Japa puspa
c) Kusmanda d) Karavellaka

347. All the following ingredients are used to prepare shveta parpai except
a) Parada b) Tuvari
c) Navasadara d) Kalmisora

348. Nata bhusana is the synonym of
a) Tamra b) Abhraka
c) Gairika d) Haratala

349. "Gauri Teja" is the synonym of
a) Abhraka b) Gandhaka
c) Parada d) Makshika

350. One of the ingredients of candrodaya varti is
a) Manashila b) Haratala
c) Abhraka d) Makshika

351. Find out "Netra rogari" in the following
a) Rasa b) Rasaka
c) Gandhaka d) Makshika

352. Chemically giri sindura is
a) HgO b) HgS
c) PbS d) None

353. Rasakam is included in as per Rasaratna Samuchchaya
a) Dhatu b) Upadhatu
c) Uparasa d) None

354. Kanksi, subhra, tuvari are the synonyms of
a) Sphatika b) Tankana
c) Abhraka d) Gandhaka

355. Shilajatu is not an ingredient in
a) Arogya vardhini vati
b) Candra prabhavati
c) Siva gutika
d) None of these

356. The sodhana of vimala is done by the svarasa of
a) Vasa b) Jambira
c) Mesashringi d) None

357. The dose of somala (malla) bhasma is as per Rasa Tarangini
a) 1/120-1/30 ratti b) 1/8-1/5 ratti
c) 1/150-1/120 ratti d) 0.5-1 mg.

358. In mythological point of view the rajas of Godess Parvati is
a) Abhraka b) Gandhaka
c) Parada d) Hingula

359. Number of types of abhraka are
a) 4 b) 5
c) 6 d) 8

360. Number of colours of Vaikranta
a) 8 b) 7
c) 6 d) 5

361. Which of the following is not included in maharasas
a) Vimala b) Sasyaka
c) Kapardika d) Rasaka

362. Contraindication during Shilajatu therapy
a) Kulattha c) both
b) Vidahi annapana d) Kshira

363. The svarasa is used as bhavana dravya of Tribhuvana kirti rasa is
a) Ardraka b) Tulasi
c) Dhattura d) All

364. Subhra (tuvari) is one of the ingredients present in
a) Abhraka Parpati b) Rasa parpati
c) Shveta Parpati d) Pancamriti parpai

365. Prana of rasa is as per Rasa Vagbhata
a) Suvarna makshika b) Krisna vajrabhraka
c) Tara Vimala d) None of these

366. Nirukta sesa vaikritatvam (Niscandrikaratvam) is in the context of
a) Pinaka b) Vajra abhraka
c) Gandhaka d) None of these

367. The chemical symbol of nilanjana
a) PbS b) ZnS
c) $CuSO_4$ d) None

368. The type of vajrabhraka is biotite
a) Krisna b) Shveta
c) Rakta d) Pita

369. Which of the following is extracted from rasaka/kharpara
a) Zinc b) Copper
c) lron d) Mercury

370. Musaka is the synonym of
a) Hingula b) Gauripashana
c) Haratala d) Gandhaka

371. The yantra used for Haratala Shodhana
a) Valuka yantra b) Dola yantra
c) Jarna yantra d) None

372. Rasa manikya rasa is prepared from purified
a) Manashila b) Haratala
c) Gauripashana d) None

373. The variety of abhraka is superior as per Rasaratna Samuchchaya
a) Shveta vajrabhraka
b) Krisna vajrabhraka
c) Rakta vajrabhraka
d) Pita vajrabhraka

374. Ferrus sulphate is the chemical name of
a) Kasisa c) Sasyaka
b) Haratala d) Rasaka

375. Sphatika is included as per Rasaratna Samuchchaya in
a) Maharasas b) Uparasas
c) Sadharana rasas d) None

376. Tribhuvana kirti rasa is indicated which type of jvara
a) Sannipata b) Vatapitta
c) Vatakapha d) None

377. Which of the following is the synonym of Tuttha
a) Asama garbhaja. b) Rasa garbhaja
c) Agni garbhaja d) Tamra garbhaja

378. Ananta patra is the synonym of
a) Abhraka b) Haratala
c) Manashila d) All

379. Apathya during administration of Shilajatu
a) Kadali b) Kakamaci
c) Kuluttha d) All

380. Karavellaka is the variety of
a) Capala b) Rasaka
c) Varatika d) Kapardika

381. Which of the following is useful in durmela lohani dvaya melanasya dvanda mela pan
a) Abhraka b) Makshika
c) Vimala d) Shilajatu

382. Madhu Dhatu is the synonym of
a) Shilajatu b) Makshika
c) Vimala d) None

383. Rakta dhatu is the synonym of
a) Kampillaka b) Gauripashana
c) Gairika d) Gandhaka

384. Balabhaisajya is the synonym of
a) Mandura b) Kapardika
c) Rasanjana d) Kampillaka

385. All of the following are the type of manashila except
a) Khuraka b) Kanviraka
c) Khandakhya d) Syamangi

386. Shodhana dravya of haratala is the svarasa of
a) Kusmanda b) Ardraka
c) Agastya patra d) Bhringaraja

387. Shodhana is not required for
a) Parada
c) Sphatika

388. What is Churna Parada
a) Rasendra b) Hingula
c) Rasaka d) Chapala

389. Navasadara can be obtained from
a) Karirapilu kasta b) Kasta daru
c) Kokilaksa d) None

390. Candraprabhavati is indicated in
a) Kamala b) Pandu
c) Prameha d) Hrid Roga

391. Chemically makshika is
a) Fe253 b) CuFeS,
c) Both d) None

392. Number of sadharana rasas are
a) 6 b) 7
c) 8 d) 10

393. Number of types of Anjana
a) 7 b) 10
c) 5 d) 8

394. Shveta parpai is indicated in
a) Atisara b) Pradara
c) Mukta kricchra d) Prameha

395. The ratio of parada and gandhaka present in Hingula
a) 1:6 b) 6:1
c) 1:4 d) 4:1

396. Proktam dvividham pitam panduram sadalam nirdalam tasya jani gurjara mandale is
a) Haratala b) Pitabhraka
c) Svarna d) Mriddara shringa

397. The ratio of arsenic and sulphur in haratala
a) 3:2 b) 2:3
c) 1:2 d) 2:1

398. Which of the following is not Uparasa
a) Gandhaka b) Gairika
c) Capala d) Kamksi

399. The quantity of dhanya should be taken to prepare dhanyabhraka as per Rasaratna Samuchchaya
a) 1/4 b) 1/2
c) Equal d) 1/3

400. Shodhana dravya of Makshika
a) Eranda taila b) Goksira
c) Goghrita d) None

Answer Keys

1	a	2	c	3	a	4	b
5	c	6	d	7	b	8	d
9	a	10	a	11	d	12	c
13	a	14	a	15	a	16	c
17	b	18	b	19	c	20	b
21	c	22	d	23	a	24	a
25	d	26	c	27	b	28	d
29	b	30	b	31	d	32	c
33	d	34	a	35	a	36	a
37	a	38	a	39	a	40	b
41	a	42	c	43	c	44	a
45	a	46	d	47	c	48	a
49	c	50	a	51	b	52	a
53	c	54	b	55	b	56	a
57	b	58	a	59	a	60	a
61	d	62	d	63	a	64	b
65	b	66	d	67	a	68	d
69	b	70	a	71	b	72	b
73	d	74	b	75	b	76	b
77	b	78	b	79	a	80	a
81	a	82	c	83	c	84	a
85	a	86	d	87	b	88	a
89	a	90	c	91	c	92	a
93	b	94	a	95	c	96	c
97	d	98	b	99	a	100	a
101	d	102	a	103	d	104	c
105	a	106	c	107	c	108	a
109	a	110	a	111	d	112	c
113	d	114	d	115	c	116	c
117	d	118	a	119	c	120	c
121	b	122	b	123	c	124	a
125	b	126	c	127	c	128	b
129	a	130	b	131	d	132	c
133	d	134	c	135	c	136	b
137	a	138	c	139	b	140	b

141	b	142	c	143	a	144	c
145	a	146	a	147	d	148	c
149	b	150	d	151	a	152	b
153	d	154	a	155	d	156	d
157	d	158	c	159	b	160	a
161	a	162	d	163	c	164	a
165	a	166	d	167	d	168	a
169	a	170	d	171	c	172	d
173	d	174	a	175	c	176	b
177	d	178	a	179	a	180	b
181	c	182	d	183	a	184	c
185	a	186	c	187	b	188	a
189	d	190	b	191	d	192	a
193	d	194	d	195	a	196	a
197	a	198	c	199	c	200	c
201	d	202	a	203	b	204	a
205	c	206	c	207	c	208	c
209	a	210	c	211	b	212	c
213	a	214	b	215	b	216	a
217	a	218	a	219	b	220	b
221	c	222	a	223	b	224	c
225	c	226	c	227	c	228	c
229	a	230	a	231	d	232	b
233	a	234	a	235	c	236	a
237	a	238	b	239	d	240	c
241	a	242	b	243	b	244	b
245	c	246	b	247	a	248	a
249	b	250	c	251	b	252	d
253	c	254	a	255	b	256	c
257	a	258	d	259	c	260	a
261	a	262	a	263	d	264	a
265	a	266	a	267	a	268	b
269	c	270	b	271	b	272	b
273	b	274	a	275	c	276	a
277	b	278	c	279	c	280	c
281	b	282	a	283	c	284	a
285	a	286	b	287	b	288	c

289	b	290	a	291	b	292	a
293	a	294	c	295	b	296	a
297	b	298	c	299	a	300	d
301	a	302	b	303	a	304	d
305	b	306	b	307	a	308	b
309	a	310	a	311	b	312	b
313	a	314	b	315	c	316	c
317	b	318	b	319	b	320	c
321	c	322	c	323	d	324	c
325	a	326	c	327	d	328	a
329	d	330	d	331	c	332	b
333	a	334	c	335	c	336	b
337	a	338	b	339	a	340	b
341	b	342	b	343	c	344	b
345	b	346	a	347	a	348	d
349	a	350	a	351	b	352	a
353	d	354	a	355	d	356	a
357	a	358	b	359	a	360	b
361	c	362	c	363	d	364	c
365	a	366	b	367	a	368	a
369	a	370	b	371	b	372	b
373	b	374	a	375	b	376	c
377	d	378	a	379	d	380	b
381	b	382	b	383	c	384	c
385	a	386	a	387	d	388	b
389	a	390	c	391	b	392	c
393	c	394	c	395	b	396	d
397	b	398	c	399	c	400	a

MCQs

1. The vamana drug should be collected as per Sharangadhara is at the end of.....ritu
   a) Varsha b) Sarad
   c) Vasanta d) None
2. The best season (ritu) to collect the roots of the plants
   a) Varsha-vasanta ritu
   b) Grisma-shishira ritu
   c) Varsha-hemanta ritu
   d) Vasanta-hemanta ritu
3. One kudava is equal to
   a) 16 b) 4
   c) 8 d) 12
4. One pala quantity is equal to
   a) 100 ml b) 85 ml
   c) 50 ml d) 25 ml
5. ''Prakuncanam" is included in manam
   a) Dirgha b) Tula
   c) Both d) None
6. Number of ausadha prayoga kalas are as per Susruta
   a) 8 b) 9
   c) 10 d) 11
7. One ratti is equal to.....approximately
   a) 100 mg b) 120 mg
   c) 250 mg d) 60 mg
8. The inventor of "arka" is
   a) Sharangadhara b) Ravana
   d) Charaka c) Rama
9. Kanda (Rhizome) is to be collected in ritu
   a) Grisma b) Hemanta
   c) Shishira d) Sharad
10. One pala is equal to tolas
    a) 4 b) 8
    c) 2 d) 6
11. The mana (weights and measurements) given in Caraka Samhita Kalpa Sthana is meant for kostha persons
    a) Mridu b) Madhyama
    c) Krura d) All
12. Which of the following should be used when the drava dravya is not specified
    a) Gokshira b) Jala
    c) Mutra d) None
13. One prastha is equal to
    a) 16 b) 24
    c) 64 d) 100
14. Which of the following drugs should not be used fresh
    a) Vidanga c) Punarnava
    b) Guduchi d) All
15. Vidanga (Embelia ribes) must be used in
    a) Newly collected b) Old form
    c) Both d) None
16. Samudgam is a type of
    a) Dhanya
    b) Bhaishajya Kalpana
    c) Bheshaja kala
    d) Ahara Kalpana
17. Collection of leaves advised by Caraka in ritu
    a) Varsha c) Sharad
    b) Grishma d) Hemanta
18. Which of the following drug should be used in fresh
    a) Pippali b) Vidanga
    c) Shatavari d) None
19. Which one of the following should be used after one year from the collection time
    a) Guduchi b) Shatavari
    c) Pippali d) None
20. Volatile oils are extracted by using
    a) Damaru yantra
    b) Arka yantra
    c) Patala yantra
    d) Vidhyadhara yantra
21. Shelf life of laghupaka ausadhi
    a) 2 months b) 4 months
    c) 8 months d) 1 year

22. Bhavana facilitates as per Charaka
    a) Potentiation b) Sublimation
    c) Dissociation d) None
23. Kashaya Kalpana is not possible with
    a) Madhura rasa b) Lavana rasa
    c) Amla rasa d) Tikta rasa
24. One gunja approximately is equal to
    a) 125 mg b) 62.5 mg
    c) 250 mg d) 500 mg
25. According to Charaka, Kshira should be collected during
    a) Sarada ritu b) Vasanta ritu
    c) Varsa ritu d) Hemanta ritu
26. Number of basic kalpanas (primary kalpanas) for drugs as per Charaka
    a) 5 b) 7
    c) 6 d) 8
27. The collection time of sakha and patra in ritu as per Charaka Samhita
    a) Grishma & sharada
    b) Varsha & Vasanta
    c) Sisira & Hemanta
    d) None
28. The quantity of suska dravyas should be taken in a Bhaisajya Kalpana
    a) Equal b) Double
    d) None c) Half
29. Sixty grains is equal to
    a) 1 dram b) 2 drams
    c) 1 ounce d) 2 ounces
30. One ratti is equal to
    a) 125 mg b) 250 mg
    c) 375 mg d) 500 mg
31. If the useful part of plant is not mentioned in yogas then the is used
    a) Whole plant b) Stem bark
    c) Root d) Sara
32. Ushna and Tiksha dravyas should be collected during ritu
    a) Sarad b) Vasanta
    c) Shishira d) Varsha
33. Ausadhakalas are five as per
    a) Charaka b) Sushruta
    c) Vagbhata d) Sharangadhara
34. Ausadhakala as per Sarangadhara in case of lekhana and brimhana dravyas
    a) Dvitiya b) Tritiya
    c) Caturtha d) Pancama
35. Saviryata avadhi for avaleha as per Sharangadhara
    a) Masat b) Masat dvaya
    c) Vatsaratparaa d) Varsat dvaya
36. Tvak kanda kshira should be collected in ritu
    a) Vasanta b) Varsha
    c) Sarada d) Hemanta
37. Ausadha kala in case of Apana Vata Vikriti
    a) Pragbhakta b) Madhyabhakta
    c) Paschat bhakta d) Samudga
38. Measurement of kudava patra as per Sarangadhara in angulas
    a) 2x2x2 b) 4x4x4
    c) 6x6x6 d) 8x8x8
39. Number of types of Abhesaja is
    a) 2 b) 4
    c) 10 d) 6
40. According to Caraka, one prakunca is equal to
    a) Pala b) Picu
    c) Kavala graha d) Karsa
41. Bhautik predominance in laghu Dravyas
    a) Akasha c) Vayu agni
    b) Prithvijala d) Agni Akasha
42. Substitute for anukta patra as per Sarangadhara
    a) Loha patra
    b) Mrittika patra
    c) Kamsya patra
    d) Tamra patra
43. Pancha kolas are
    a) Sunthi pippall marica cavya citraka
    b) Sunthi pippall pippalimula, cavya citraka
    c) Sunthi pippall marica, katuki citraka
    d) Sunthi pippali marica, cavya citraka

44. The arka preparations are extensively mentioned in
    a) Bhaisajya Ratnavali
    b) Rasaratna Samucaya
    c) Arka Prakasa
    d) Ayurveda Prakasa
45. Number of kashaya yoni are as per Charaka
    a) 4 b) 3
    c) 2 d) 5
46. Putapaka kriya is useful to prepare
    a) Kwatha b) Svarasa
    c) Asava d) Churna
47. All are included in Kasaya kalpana except
    a) Svarasa b) Phanta
    c) Avaleha d) Kalka
48. Puapaka svarasa method is useful to extract
    a) Iksu b) Tulasi
    c) Vasa d) Kumari
49. According to Sharangadhara, the Pramathya can be made by utilising
    a) 1 part kalka and 8 parts water
    b) 1 part kalka and 4 parts water
    c) 1 part kalka and 6 parts water
    d) 2 parts kalka and 8 parts water
50. Number of Kashaya kalpanas mentioned by CHaraka
    a) 4 b) 5
    c) 6 d) 7
51. The ratio of Dravya and water in Hima Kalpana
    a) 1:4 c) 1:8
    b) 1:6 d) 1:12
52. According to Sharangadhara, two palas is the dose of
    a) Swarasa b) Kalka
    c) Hima d) None
53. Kwatha will be in nature than Phanta
    a) Laghu b) Guru
    c) Laghu tara d) None
54. The drug and water ratio used in Kashaya as per Sharangadhara
    a) 1:4 b) 1:6
    c) 1:16 d) 1: 6
55. The ratio of Tandula and Jala in Manda Kalpana is
    a) 1:4 b) 1:6
    c) 1:8 d) 1:14
56. Hima kasaya is indicated generally in rogas
    a) Vataja b) Pittaja
    c) Kaphaja d) None
57. Guggulu tiktaka kasayam is mentioned in
    a) Charaka Samhita
    b) Sushruta Samhita
    c) Astanga Sangraham
    d) Sharangadhara Samhita
58. Find out sita kasaya in the following
    a) Phanta b) Hima
    c) Kashaya d) Svarasa
59. In phanta kalpana, the kasaya should be reduced upto
    a) 1/4 part b) 1/2 part
    c) 1/8 part d) None
60. The best suitable dravya for putapaka Swarasa
    a) Vasa b) Tulasi
    c) Kumari d) Mandukaparni
61. The quantity of jala in the preparation of Mridu Dravya Kwatha
    a) 2 parts b) 5 parts
    c) 4 parts d) 8 parts
62. Arka is prepared out of
    a) Amra b) Ajamoda
    c) Ashwagandha d) Aragvadha
63. The preparation obtained by distillation of drugs soaked in water is
    a) Asava c) Arka
    b) Arista d) Prasanna
64. Suitable method to extract the volatile substance of a Dravya is
    a) Arka b) Hima
    c) Phanta d) Kwatha
65. The Dravya is suitable for Arka
    a) Ashwagandha c) Ajamoda
    b) Aragvadha d) Aralu

66. Laksa rasa kalpana is included as per Sarangadhara in .... Kalpana
a) Kashaya b) Corna
c) Swarasa d) Pramathya

67. Guduchi as medhya rasayana should be used in the form of
a) Swarasa b) Kalka
c) Kwatha d) Kshirapaka

68. Churna drava is the synonym of ..... kalpana
a) Asava b) Arista
c) Kashaya d) Phanta

69. Which of the following dravyas is not found in sadanga paniyam
a) Lavanga c) Parpataka
b) Chandana d) Shunthi

70. The Saviryata avadhi (shelf life/expiry period) of pancavidha kashya kalpana
a) 1 week b) 2 weeks
c) 1 day d) 1 month

71. Balwan kalpana out of pancavidha kashaya kalpanas
a) Swarasa c) Hima
b) Kashaya d) Phanta

72. Find out cold infusion in the following
a) Swarasa b) Kalka
c) Hima d) Phanta

73. Kshira kalpana is an upakalpana of kalpana
a) Swarasa c) Phanta
b) Kwatha d) Hima

74. Number of maha kasayas mentioned by Charaka
a) 40 b) 50
c) 60 d) 70

75. The dose of phanta in general as per Sharangadhara
a) 1 pala b) 2 palas
c) 3 palas d) 4 palas

76. In Svarasa Kalpana, the sloka "yantra nispiditat is told by
a) Charaka b) Sushruta
c) Vagbhata d) Sharangadhara

77. Sneha kasaya is told by
a) Charaka b) Sushruta
c) Kashyapa d) None

78. The drug absent in sadanga paniyam as per Sharangadhara Samhita
a) Sunthi and usira
b) Pippali and Maricha
c) Musta and parpata
d) Candana and udicya

79. The duration of soaking period of raw material to extract svarasa
a) 1 hour b) 12 hours
c) 24 hours d) 1 week

80. Sunthi putapgka svarasa is indicated in
a) Rakta pitta b) Pandu
c) Kamala d) Amavata

81. The ratio of drug and water used in the preparation of phanta as per Sharangadhara Sarhhita
a) 1:4 b) 1:6
c) 1:8 d) 1:10

82. Extract of drug dissolved in water is
a) Syrup base b) Medicated oils
c) Fermentation d) Decoction

83. According to Caraka, the best medhya dravya is Shankhapuspi which is administered in the form of
a) Swarasa b) Pua paka svarasa
c) Phanta d) Kalka

84. According to Sharangadhara Samhita, the kalka of mahanimba is specially useful in
a) Paksa ghata b) Ardita vata
c) Apabahuka d) Gridhrasi

85. Sankhapuspi as per Caraka is as medhya in the form of
a) Kshira paka
c) Kalka

86. Niruhya is the synonym of 86 Hyd-1988, Tri-1990 kalpana
a) Svarasa b) Kalka
c) Sandhana d) Kwatha

87. The ratio of dravya and water used in paniya Kalpana
    a) 1:8 b) 1.16
    c) 1:32 d) 1:64
88. Type of water is used in phanta Kalpana
    a) Cold water b) Hot water
    c) River water d) None
89. According to Sharangadhara, Rasona should be used in Gridhrasi in the form of
    a) Putapaka Swarasa b) Swarasa
    c) Niruhya d) Srita
90. Therapeutic dose of kalka as per Sharangadhara
    a) 1 karsha b) 1/2 karsha
    c) 1 pala d) 1/2 pala
91. Hina virya kalpana in the following
    a) Svarasa b) Kalka
    c) Sita d) Phanta
92. The ratio of dravya and kcÓra in kshirpaka as per Sharangadhara
    a) 1:8 b) 1:16
    c) 1:4 d) 12
93. The dose of Kshirapaka as per Sharangadhara
    a) 1/2 pala b) 1 pala
    c) 2 pala d) None
94. Tandulodaka is used for
    a) Preparation of decoction
    b) Anupana
    c) Vrana Shodhana
    d) Chaksu praksalana
95. The ratio of dravya and jala to prepare sadanga paniyam
    a) 1:4 b) 1:8
    c) 1:6 d) 1:64
96. The best anupana as per Vagbhata
    a) Madhu b) Ghrita
    c) Manda d) Antariksa jala
97. Number of kasaya kalpanas as per Sushruta
    a) 5 b) 4
    c) 6 d) 7
98. "Ksunne dravya pale samyakjalam usnam viniksipet. Mritpatre kudavonmanam tatastu sravayed patat" as per Sarangadhara is in the context of
    a) Phanta b) Sita
    c) Kvatha d) Pramathya
99. Ausadha prayoga kala for hingvastaka churna
    a) Prathama kabala b) Muhurmura
    c) Samudga d) Antarbhakta
100. The main constituent of layi churna is
    a) Vijaya b) Haritaki
    c) Jatiphala d) Kutaja
101. The approximate dosage of Churna preparations in general as per Sharangadhara
    a) 5 gms b) 10 gms
    c) 15 gms d) 20 gms
102. To prepare a coarse powder the shieve number is used
    a) 40 b) 80
    c) 120 d) 100
103. Expiry period for Churna (herbal powder) as per Sharangadhara is
    a) 2 months b) 6 months
    c) 4 months d) 12 months
104. According to Sharangadhara, ksoda is the synonym of
    a) Gutika b) Avaleha
    c) Churna d) Gudapaka
105. Muktadi Churna is advised as per Charaka in
    a) Hikka b) Jvara
    c) Pandu d) None
106. Yavani sadava is mainly indicated in
    a) Arocaka b) Jvara
    c) Raktapitta d) Hikka
107. Number of ingredients present in sitopaladi churnam
    a) 10 b) 3
    c) 7 d) 5
108. The main ingredient present in Candra Prabhavati is
    a) Karpura b) Balonci
    c) Shilajatu d) Haritaki

109. The major/main ingredient present in Chyavanaprasa
a) Haritaki b) Vibhitaki
c) Amalaki d) Arjuna

110. Number of astavarga dravyas included in the preparation of Cyavanaprasa as per Charaka
a) 4 b) 5
c) 6 d) 8

111. Riches source of Vitamin "C" in the following
a) Cyavanaprasa avaleha
b) Vasavalehya
c) Dashamula rasayanaa
d) All

112. The main/major ingredient present in arogyavardhini vai is
a) Guggulu c) Katuki
b) Nimbatvak d) None

113. Which of the following dravya svarasa used for sutasekhara rasa is
a) Ardhraka b) Bhringaraja
c) Tulasi d) Brahmi

114. Singha/simha nada guggulu consists of
a) Kapikaccu b) Simhasya
c) Eranda taila d) Katuki

115. The preparation tested by dipping in water is Kalpana
a) Ghrita b) Avaleha
c) Gutika d) Snehapaka

116. Dosage of avaleha in general as per Sharangadhara
a) 1 karsa b) 2 karsa
c) 1 pala d) 2 pala

117. "Rasa kriya" is the synonym of
a) Svarasa b) Kalka
c) Avaleha d) Aristha

118. Agasthya haritaki is prescribed in
a) Hikka, Shwasa and kasa
b) Jvara and Atisara
c) Grahani and pandu
d) Motraghata and Ashmart

119. Ghana sara is otherwise known as
a) Leha b) Vilepi
c) Piyusa
d) Concentrated decoction

120. Tara mandura is a type of ..... preparation
a) Asava c) Kashaya
b) Avaleha d) Churna

121. Darvi pralepa is the sign of siddhi pariksa
a) Taila b) Ghrita
c) Avaleha d) Kvatha

122. Kshara is prepared from which of the following Dravyas
a) Amrita b) Apamarga
c) Arjuna d) Amalaki

123. General dosage of Kshara is
a) 125 mg b) 250 mg
c) 500 mg d) 100 mg

124. The process involved in the preparation of Kshara
a) Boiling b) Soaking
c) Melting d) Sublimation

125. The term "Gata rasatva" according to Charaka is
a) Tastelessness b) Free from potency
c) Paste taste d) None of these

126. Bhavana dravya used to prepare smriti sagara rasa is
a) Brahmi b) Vacha
c) Jyotismati d) All

127. Varti is otherwise known as
a) Pichu b) Patta
c) Kavalika d) Vikesika

128. Rasanjanam is derived from
a) Daruharidra b) Haridra
c) Amragandha haridra d) Kumari

129. Amrita satva is obtained from
a) Guggulu b) Guduchi
c) Vatsanabha d) Amalaki

130. Eranda taila is an ingredient present in
a) Vatari guggulu b) Yogaraja guggulu
c) Simhanada guggulu d) A & C above

131. According to Sharangadhara, gomutra is used as bhavana dravya in the preparation of
a) Sanjivani vati b) Pranada gutika
c) Rasona vati d) All of these

132. Nidigdikadi leha kantakaryava leha) is indicated as per Sharangadhara in
a) Hikka, Shwasa and kasa
b) Jvara and raktapl̥tta
c) Kustha and visarpa
d) Atisara and Grahani

133. The process involved in hingu Shodhana
a) Mardana b) Swedana
c) Bharjana d) None

134. Which of the following is used in Cadraprabha varti
a) Aja Dugdha b) Go dugdha
c) Gomutra d) None

135. The material found in satva
a) Starch b) Protein
c) Fat d) Tri glycerides

136. Find out suska kalka in the following
a) Churna b) Vati
c) Varti d) Vataka

137. Major quantity of ingredient present in sudarsana churna
a) Sudarsana c) Nimba
b) Guduchi d) Kirata tikta

138. Major ingredient of narayana churna
a) Satala b) Palasa
c) Trivrit d) Haritaka

139. The following number shieve should be used for preparing fine powder
a) 100 b) 80
c) 40 d) 120

140. The major ingredient required to prepare avipattikara Churna
a) Katuki b) Trivruta
c) Nimba d) Guduchi

141. One of the ingredients present in Sanjivani Vati
a) Vatsanabha b) Bhallataka
c) Kuchala
d) Vatsanabha and Bhallataka

142. Vai preparations loose their potency after months as per Sharangadhara
a) 6 b) 12
c) 24 d) 60

143. The hingu should be mixed in the preparation of hingvastaka Churna after
a) Frying b) Beating
c) Roasting d) Churning

144. According to Caraka Samhita, the rogadhikara of sitopaladi churna is
a) Hikka b) Shwasa
c) Kasa d) Rajayakshma

145. Guduchi satva is
a) Ghana satva
b) White powder derived from stem
c) Brown powder
d) None of these

146. Layi Churna is mainly indicated in
a) Amavata b) Atisara
c) Ajirna d) Anantavata

147. Bhanga is one of the ingredient present in
a) Hingvanaka churna
b) Lavanabhaskara Churna
c) Layi Churna
d) Hingudviruttaradi Churna

148. The major ingredient present in brahma Rasayana
a) Haritaki b) Amalaki
c) Bibhitaki d) Arjuna

149. Arjuna tvak decoction is used as bhavana dravya to prepare
a) Pradarantaka vati b) Plihari vati
c) Prabhakara vati d) Pranada gutika

150. "Kvathadinam punahpakayoh tat ghanantaram iti
a) Vati Kalpana c) Pramadhya
b) Rasa kriya d) None of these

Key Answers

1	c	2	b	3	a	4	c	5	b
6	c	7	b	8	b	9	dc	10	a
11	b	12	c	13	c	14	a	15	b
16	c	17	a	18	c	19	c	20	b
21	d	22	a	23	b	24	a	25	a
26	a	27	b	28	b	29	a	30	a
31	c	32	a	33	d	34	d	35	c
36	c	37	a	38	b	39	a	40	a
41	c	42	b	43	b	44	c	45	d
46	b	47	c	48	c	49	a	50	b
51	b	52	c	53	b	54	c	55	d
56	b	57	c	58	b	59	d	60	a
61	c	62	b	63	c	64	a	65	c
66	a	67	a	68	d	69	a	70	c
71	a	72	c	73	b	74	b	75	b
76	b	77	c	78	b	79	c	80	d
81	a	82	d	83	d	84	d	85	c
86	c	87	d	88	b	89	d	90	a
91	d	92	a	93	c	94	b	95	d
96	d	97	c	98	a	99	a	100	a
101	b	102	b	103	a	104	c	105	a
106	a	107	d	108	c	109	c	110	b
111	a	112	c	113	b	114	c	115	d
116	c	117	c	118	a	119	d	120	b
121	c	122	b	123	b	124	a	125	a
126	d	127	c	128	a	129	b	130	d
131	a	132	a	133	c	134	a	135	a
136	a	137	d	138	a	139	d	140	b
141	d	142	b	143	a	144	d	145	a
146	b	147	c	148	b	149	c	150	b

About the Authors

Dr. Vinay Kumar Kadibagil has completed graduation from Ayurveda Mahavidhyalaya, Hubli in 2001.He has completed post-graduation and PhD in Rasashastra and Bhaishajya Kalpana from BLDE'S AVS Ayurveda Mahavidhyalaya, Vijayapur, Certificate in yoga science (CYS) from Karnataka University Dharwad, Karnataka.

He is recognized PG and PhD guide at Rajiv Gandhi University of Health Sciences, Karnataka and presently working as professor at Department of Rasashastra & Bhaishajya Kalpana, SDM College Of Ayurveda & Hospital, Hassan. He has 19 years of UG and PG teaching experience. He has presented many papers and served as resource person in National and international seminars. He has published more than 100 articles in international journal. He has completed 3 research projects and 3 research projects in hand. He is reviewer and editorial member for reputed journals.

Prof. Bargale Sushant Sukumar completed Graduation and Post-Graduation in Swasthavritta and Ph.D. in Ayurveda (Swasthavritta) from Rajiv Gandhi University of Health Science, Bangalore, Karnataka. He completed M. Sc. [Yoga) from Periyar University (PRIDE), Salem Tamil Nadu and M.Sc. (Psychology) from Madurai Kamaraj University, Tamil Nadu. Currently working in Department of Swasthavritta and Yoga at Sri. Dharmasthala Manjunatheshwara College of Ayurveda and Hospital Hassan, Karnataka. He published more than 70 articles in National and International Peer Reviewed journals and presented more than 35 guest lectures, papers in various colleges, International and National conferences. He is acclaimed teacher for Graduate, Post Graduate and Ph. D scholars.

About the Book

Rasashastra & Bhaishajya Kalpana is one of the most important branch of Ayurveda. It basically deals with the preparation of Ayurvedic medicines using Metallic/Mercurial, Nonmetallic & herbomineral drugs. Rasasastra subject covers the entire field of inorganic pharmaceutical preparations like metallics, non-metallic compound of Ayurvedic materia medica. These Rasausadhis are appreciated for their smaller dosages, quicker effectiveness, long durability etc. Thus, the Rasausadhi preparations plays an important and major role in curing the alling human beings. Bhaishajya Kalpana mainly covers the entire field of Herbal & organic pharmaceutical preparations like Swarasa, Kashaya, Churna, Guti-Vati, Asava-Arishta, Avaleha, Ghrutam-Tailam etc. Sometime to compete with need of all time availability, easy dispensing, palatability etc and for such enumarable reasons a lots and lots of Kalpanas are developed.

The present book is basically intended for the Under Graduate students of Ayurveda studying in 2nd Professional B.A.M.S. Arrangement of chapter in this text book of Rasashastra & Bhaishajya Kalpana according to Course Curriculum for Second Professional BAMS (Prescribed By NCISM). Important references for Bruhatrayis, Laghutrayi, books related to Rasashastra and Bhaishajya Kalpa have been collected. Book covered all the syllabus topics chapter wise Ayurvediya Aushadhi Nirmana, Paribhasha, Adharbhuta Siddhanta, Yantropakaranani I and II, Kalpana Nirmana I and II, Rasa Dravya Parichaya I, II and III, Kalpana Niramana, Chaturvidha Rasayana, Current and emerging trend in Ayurvedic and Pharmaceuticals and GMP (Schedule T) & Regulatory aspects of Ayurvedic drugs. Highlighted all most all the concepts of Rasashastra and Bhaishajya Kalpana in a simple language with illustration of tables, chart, and images.

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